TECHNOLOGY DEPT

APRIL
1933

First Copy

FLEET OWNER

THE FERGUSON PUBLISHING CO., 90 WEST ST., NEW YORK, N.Y.

Devoted to the Better Operation and Maintenance of Truck, Bus, Taxicab, Passenger Car and All Automotive Fleets

THIS MONTH WE PRESENT:

Determining Future Operating Policies . . **Page 12**
By E. E. La Schum

Reducing Department Store Fleet Costs . . **Page 10**
By Walter Woodward

What Constitutes "Adequate" Brakes? . . **Page 16**
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Some Tips on Air Cleaner Maintenance . **Page 20**
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How to Lubricate Outdoor Equipment . . **Page 24**
By Owen C. Jones

Power Steering—a New Development . . **Page 30**
By S. Johnson, Jr.

Question-of-the-Month Club . . . . . **Page 38**

And Our Usual Departments

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. . . after the 14 vehicles of Tri-State Motor Transport, Inc., were *POWER PROVED*

ALTHOUGH the Tri-State Motor Transport, Inc., of Joplin, Missouri, have used POWER PROVER service only two months, they report a 10% reduction in gasolene costs.

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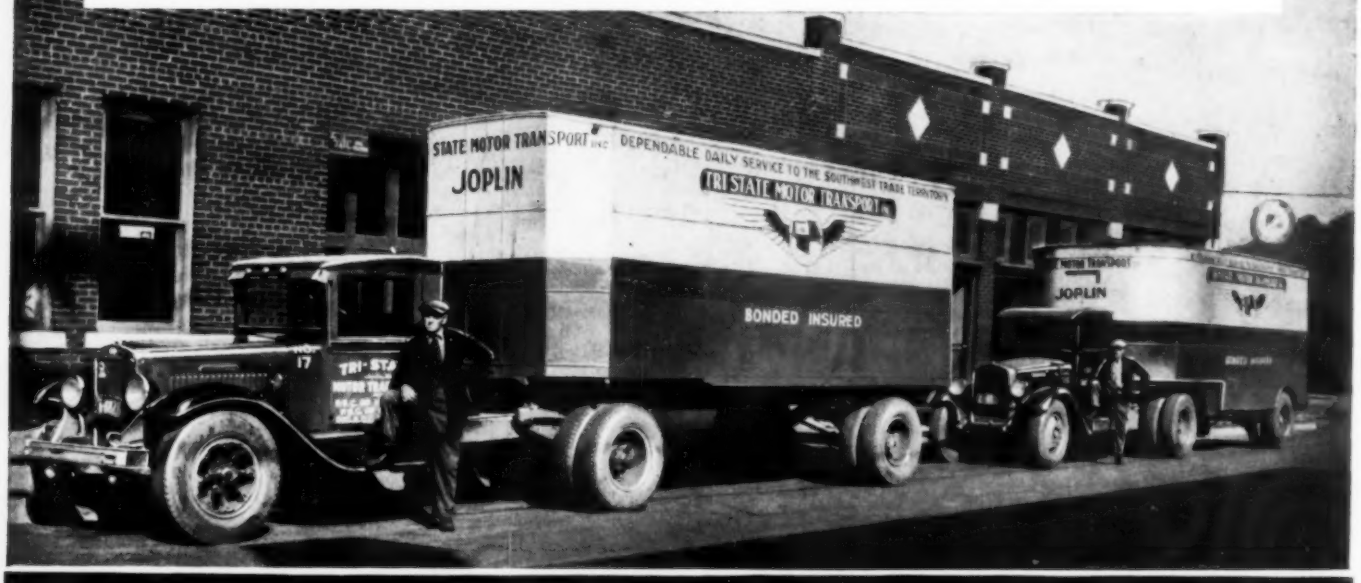

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OUR ½ PRICE OFFER STILL STANDS!

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for one-piece interior panels, headlinings, roofs and floors

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AN entirely new development in the panel field, Phemaloid Compound Lumber, is electrically processed with a phenol-formaldehyde colloidal resin which is immune against moisture, fungi, and mold, the main causes of rot . . . The panels are cross-laminated of real wood, and can be sawed, shaped, and painted like regular lumber. . . . Stock sizes are 6 feet by 8 feet, 8 feet by 11½ feet, and 8 feet by 17 feet; larger panels can be made to your specifications. . . . Phemaloid Compound Lumber is ideal for commercial body construction. . . . It offers the following advantages — lightness, great strength, large one-piece panels eliminating joints, and simplifying installation; immunity from deterioration *all at a most attractive price.*

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CHICAGO, ILL.

Phemaloid already has been adopted as a standard lining panel for one of the large chain fleets. Write today for your copy of our booklet on Phemaloid.

The

FLEET OWNER

Published Monthly in the interests of Automotive Fleet Owners who maintain their own Repair and Service Shops and devoted to the better Operation and Maintenance of Truck, Trailer, Bus, Passenger Car, Taxicab and all Automotive Fleets.

VOL. 10 New York, April, 1933 No. 4

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Published Monthly by

The FERGUSON PUBLISHING COMPANY

90 West Street, New York City

E. F. Ferguson
President

A. L. Conley
Sec. and Treas.

Henry Clay Fischer
Editor

ADVERTISING REPRESENTATIVES:

Chicago—D. B. Tratt, 840 Montrose Ave., Tel. LONg Beach 2331.
Detroit—E. C. Hilliker, 190 E. Grand Blvd., Tel. Fitzroy 9382.
Los Angeles—R. H. Deibler, 244 W. 15th St., Tel. Richmond 5274.
New York—J. Hayes Fuller, 90 West Street, Tel. REctor 2-9179.
Philadelphia—Hal. H. Clark, 170 Woodbine Rd., Manoa, Pa.

Subscription: $1.00 Yearly; Single Copies 10c.

Member of Controlled Circulation Audit, Inc.

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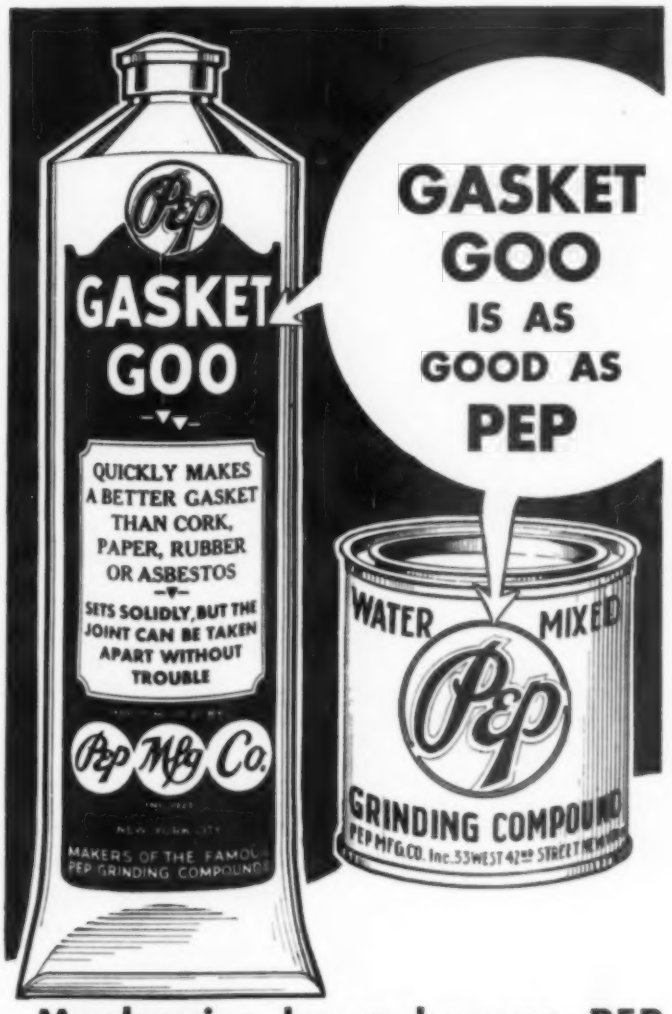
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They
are your Responsibility

When this family steps into a bus or a taxi-cab they are entitled to Safety Glass protection. What's more, they're going to look for it. That's why Safety Glass all-around in all buses and cabs is more than just the best way of minimizing claims for injury resulting from broken, flying glass. It's one of the best ways there is, right now, of creating *goodwill.* Show your passengers that you are providing every available protection, and they will show their appreciation by continued patronage.

L-O-F *super* Safety Glass is used by Packard • Graham • Studebaker • Franklin • Reo • Willys Ford • Cadillac • LaSalle • Lincoln • Buick • Chevrolet • Oldsmobile • Pontiac • Rockne Auburn • Cord. In addition to the cars listed above L-O-F Safety Glass is also used in Dietrich and LeBaron Custom Bodies, Reo Speed Wagons, Twin Coaches, Brill Trolley Buses, Cincinnati Trackless Trolley Coaches, Bender Bus Bodies, Hackney and Springfield School and Passenger Bus Bodies, White School Buses, York-Hoover School Bus Bodies, Crown School and Motor Coach Bodies, Ford School Buses, Stinson, Stearman and Waco Aircraft, Gar Wood Boats, Matthews Cruisers and Chris-Craft Cruisers and Runabouts.

L O F

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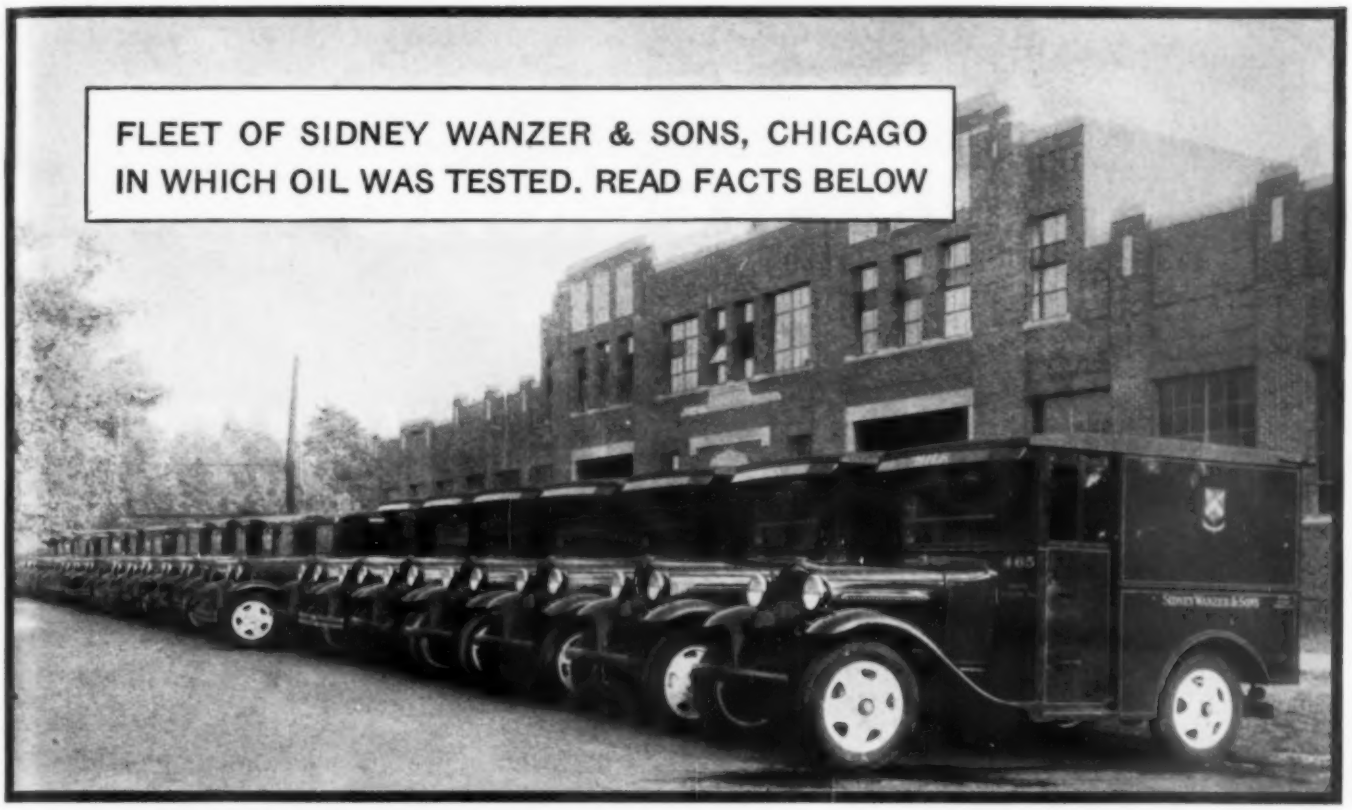
LIBBEY-OWENS-FORD GLASS COMPANY, TOLEDO, OHIO, manufacturers of Highest Quality Flat Drawn Window Glass, Polished Plate Glass and Safety Glass; also distributors of Figured and Wire Glass manufactured by the Blue Ridge Glass Corp. of Kingsport, Tennessee.

Say "I saw it in FLEET OWNER"—It Helps!



UNUSUAL TEST AGAIN PROVES STRENGTH AND ECONOMY OF THIS TOUGH-FILM OIL

Chicago dairy praises performance in severe service —Read how to cut operating costs on your fleet

EXCESSIVE carbon—crankcase dilution—fouled and sluggish motors—they're familiar troubles to fleet owners whose truck engines must idle almost constantly. That's why a dairy's truck fleet is a genuine "tough spot" for any oil. These trucks travel only a few yards at a time. Then motors idle while several deliveries are made. Engines have no chance to burn away carbon or evaporate gasoline that finds its way into the oil.

It's these tough assignments that *Tough-Film* Pennzoil is made for. And how it meets them! For example, Sidney Wanzer & Sons, large Chicago dairy, writes "We have been very much pleased with the efficient lubrication Pennzoil has provided in our trucks. Our delivery service requires almost constant idling of motors and we have found, under these conditions, that your oil stands up unusually well."

Thank you, Mr. Wanzer! We know that this means a real saving in the operating cost of your big fleet. By "standing up unusually well" this *Tough-Film* oil decreases dilution, carbon and motor fouling. It keeps your engines quiet, powerful and efficient at lower cost. It saves gasoline for you. And, of course, it saves on your oil costs.

Hundreds of fleet operators in every part of the country are proving in actual service that *Tough-Film* Pennzoil does save money. That it does stand up better and last longer under severest service requirements. A large transportation system reports 50% reduction in maintenance costs after changing to Pennzoil. A large motor coach company reports a 62% reduction in oil consumption.

Get the facts about oil performance right now. Let us tell you what others in your line of business have saved with *Tough-Film* Pennzoil. The coupon will bring the facts without obligation. Sign and mail it today.

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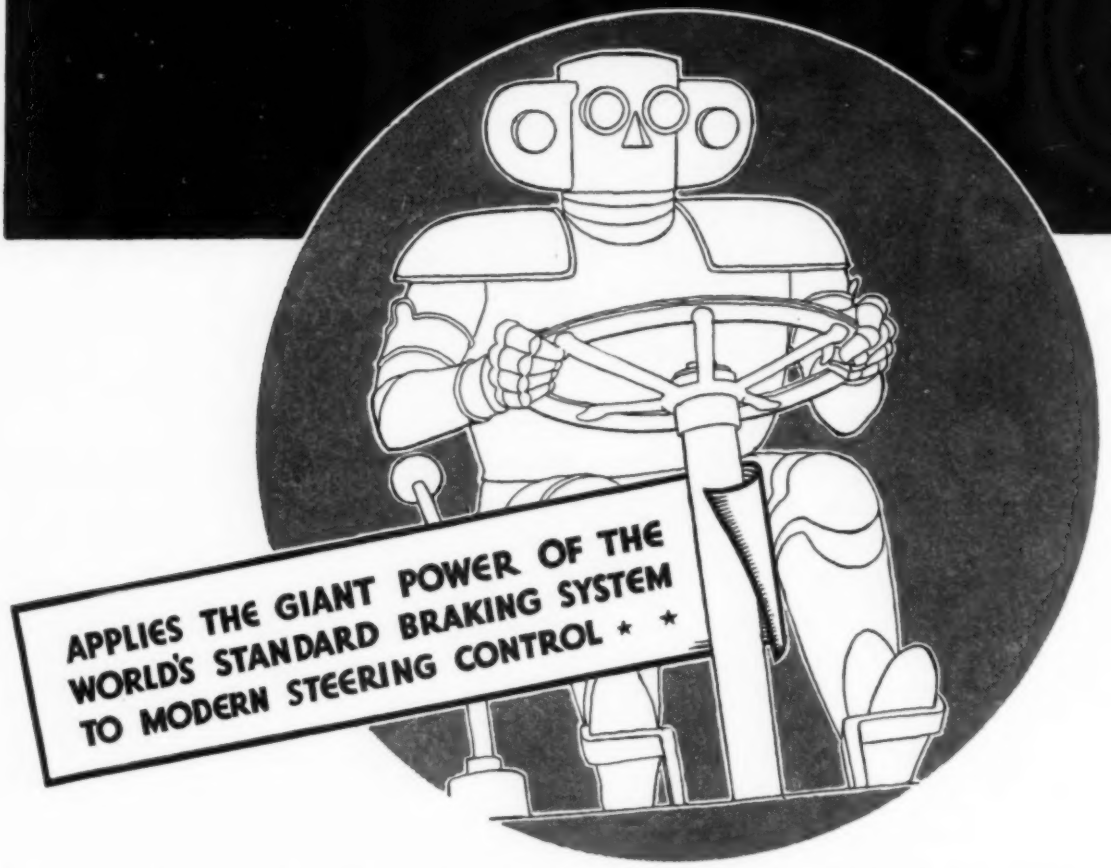
another
BENDIX·WESTINGHOUSE
engineering triumph



As a crowning acheivement to years of intense research and development, Bendix-Westinghouse Air Steering Control makes its bow. Easily the most important development in modern motor transport control since the advent of the Air Brake, this unique device offers a positive solution to the rapidly growing steering problem. Built as you would expect Bendix-Westinghouse to build it, Air Steering consists of a compact, light, yet sturdily constructed, double-acting cylinder controlled by a simple valve arrangement and is readily adaptable to any vehicle using a conventional manually-operated steering gear. Ingeniously combining the recognized power and flexibility of air, with just enough physical effort to maintain a desired "wheel feel," Air Steering draws upon the vehicle's existing pneumatic source for the comparatively negligible amount of air required for its operation. Reflecting the traditional features of its lineage, Air Steering assures positive control at all times, even in the remote event of power failure and requires little attention after initial, simple adjustment.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY, PITTSBURGH, PA.

Say "I saw it in FLEET OWNER"—It Helps!

VOL. 10
NO. 4

The FLEET OWNER

APRIL
1933

DEVOTED TO THE BETTER OPERATION AND MAINTENANCE OF TRUCK, TRAILER, BUS, TAXICAB, PASSENGER CAR, AND ALL AUTOMOTIVE FLEETS.

Stripping *the* Thread » »

(Ye Editor Turns Columnist)

Breathes there a man with soul so dead,
Who never unto himself hath said,
When on a bolt, he stripped the thread:
"°&‡..%x ')x°°‡ v¼"°'≤"°°°''

WHO SAID HOLIDAYS?

● Moratoria may come and go, but there are no "holidays" in the maintenance departments of well operated fleets, judging from the unusual activity in those fleet shops visited by us during the recent national bank holiday. In our favorite neck-of-the-woods, things seemed to go on just as usual; in fact we might have noticed a bit of extra activity in the "appearance - maintenance" departments, meaning washing, cleaning, painting and polishing. The depression-mourner would attribute this to "usual Spring clean-up". We hope, however, it is but the "handwriting on the wall" and the first symptoms of the "new deal" that F. D. R. is beginning to hand out to us.

WE'VE GOT 'EM ALL

● With the advent of 3.2 per cent beer (by the time you get this you will have had ample time to sample it) our business department is becoming besieged with requests for lists of breweries. Shame on you, boys. Most of the breweries have been operating their fleets, beer or no beer. Delivering what? Why, near-beer, beverages, ice-cream, malt extracts, cereal products, etc. etc. They have given Old Dobbin the air long ago, operating fairly modern gas and electric trucks. It is true that some breweries have lain dormant, and that new breweries have (or will have) come into being. With the able assistance of —— (well, why give away a secret?), our brewery list will be as complete as possible. To us it looks as if there will be somewhat of a falling off in the taxicab industry—the favorite method of delivering beer to New York "speakies" was via this vehicle, to the tune of one barrel per taxicab. Now the legitimate brewers will use modern trucks. Pardon us for pointing.

FIGURES DON'T LIE

● We're not much on statistics, but the figure sharks tell us that brewers will spend in the neighborhood of $15,000,000 for automotive equipment just as soon as beer is made legal. Other estimates, including the House Ways and Means Committee's, range from $25,000,000 to $30,000,000. These statistics take into consideration the demands of *existing* brewers together with those of *new* brewers that are likely to spring up. Both trucks and passenger cars are included in the estimates. There's something for the truck salesmen to work on. Don't say we didn't put you wise.

A BEERY STORY

● While on the subject of that frothy liquid, here's a promise. We have in the course of preparation a complete operation and maintenance story covering one of Canada's largest breweries. Since most of us think well of Canadian ale and porter, perhaps their delivery experience will register well with us also. We expect to prepare this article for publication, coincident with our first drink of American 3.2, and hope to run it in May. *Watch for it!*

THAT JOB OF YOURS

● What are the duties of a fleet manager, maintenance superintendent, garage foreman, motor vehicle supervisor, or what-have-you? Everyone seems to have his own pet ideas on the subject, so we will quote from Captain G. E. Gray, Automotive Manager for Shell Petroleum: "*The success of the garage superintendent, the garage foreman and all subordinates, is gauged by their efficiency in keeping their automotive equipment on the road for the maximum number of working days in the year, at the lowest cost per mile of operation.*" There, in plain words, is the answer. Cut it out, paste it into your hat, and if your record has hit the mark, just flaunt it into the face of your President or "Big Boss" the next time you are called on the carpet at an "efficiency" meeting. If your records can't bear close scrutiny, then just forget about it.

WE STILL MEET 'EM

● What is the height of old-fashionedness? You can have your ideas, but we have ours. Don't believe it if you won't boys, but we still run into one of those anti-rebuilding gentry once in a while. Those with *mild* attacks do not believe in reboring, honing or cylinder reconditioning, claiming that they have never seen a motor that was rebuilt, perform anywhere as well as it did when new. The answer to this is that it all depends on *who* does the job, *how completely* they do it, and *how well*. The victim with the disease in its *advanced* stage will not even subscribe to engine rebuilding to the tune of a new cylinder block, pistons, rings, pins and valves. Again we reiterate, it all depends on *who* does the job, *how completely* they do it, and *how well*. A good rebuilding job should include crankshaft and camshaft reconditioning, bearings, timing chain or gears, valve gear, starting, lighting and ignition units and cooling system overhaul. Then you'll get new-vehicle performance, we believe. Ask any *real* rebuilder, either in the fleet shops, or in the trade.

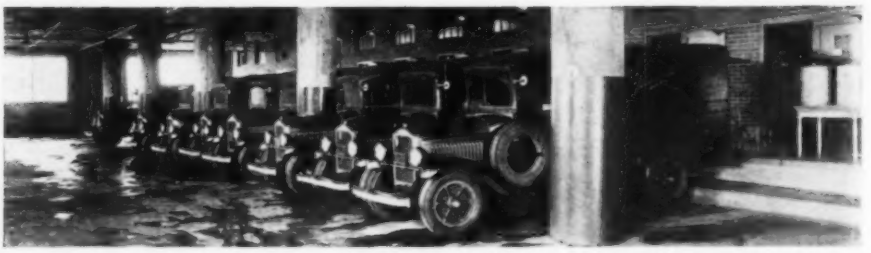
« »

H. Clay Fischer,
Editor

« »

By Walter Woodward, Supt.,
The Palais Royal Department Store, Washington, D. C.

Reducing Fleet Maintenance Costs

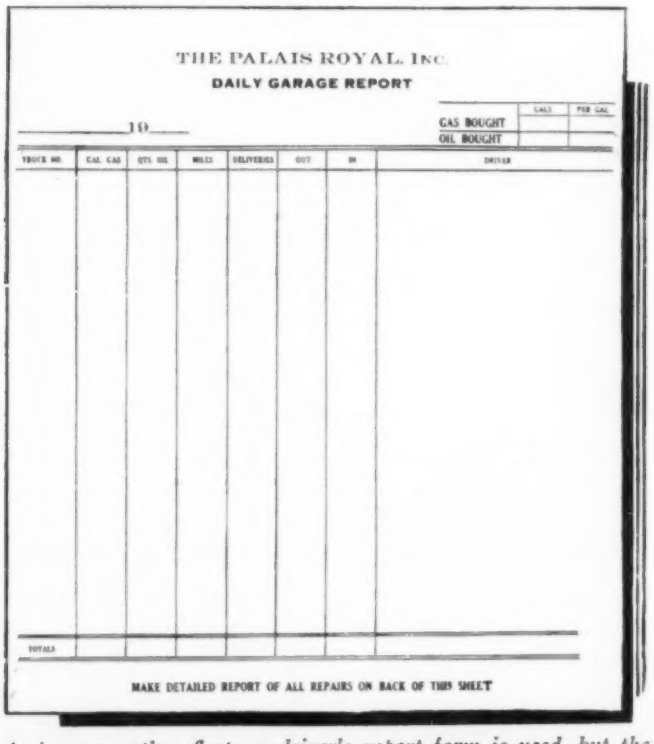


Economies Effected in Maintenance of 24 Truck Fleet Operated by Washington Department Store; as Related to Fred E. Kunkel

A FLEET of 24 trucks, 13 of which are run daily as an average, with 3 furniture trucks and one relay truck between the store and the warehouse, is operated by the Palais Royal Department Store of Washington, D. C.

We find that it pays to use extra trucks for peak loads. These trucks have already been charged off (on the books) because of depreciation, and are from 5 to 10 years old. They are still good enough to run in an emergency, because they have been kept in good running condition by our maintenance force, who have kept them well serviced and in good repair.

Consequently we have really no overhead charges, depreciation, etc., on the spare trucks used around the holidays and during peak sales periods. This method is cheaper than junking them or selling them as cast-offs and then hiring trucks for peak loads. In other words, with depreciation at the regular rate in 5 years' time a truck is considered "off the books" but they are used nevertheless on an average of five months in the year. Thus we really have nothing invested, and it is also more satisfactory than hiring extra trucks.



THE PALAIS ROYAL, INC.

DAILY GARAGE REPORT

_____ 19____

GAS BOUGHT — GALS — PER GAL.

OIL BOUGHT

TRUCK NO.	GAL. GAS	QTS. OIL	MILES	DELIVERIES	OUT	IN	DRIVER
TOTALS							

MAKE DETAILED REPORT OF ALL REPAIRS ON BACK OF THIS SHEET

As in many other fleets, a driver's report form is used, but the form shown here is used in addition, to provide a working record of each truck. Repairs are indicated on the back.

Other economies effected in this fleet include the cutting down on oil consumption. Instead of changing our oil every thousand miles, we have found that it was more economical to run anywhere from 1200 to 1400 miles by close supervision over the oil, watching it, the conditions, etc. For instance, we would take a truck after it had done 1200 miles and draw off just a little oil, which is sent to a chemist to have him analyze it; in many cases we have found that it is still good oil.

We have in the past used reclaimed oil that we purchased from a concern that does reclaiming and found it satisfactory only to some extent but finally we got some that was not satisfactory and so became wary of it. They go around to different service stations, we figured, and get transmission grease and differential grease and oil all mixed up together, so we really got all grades of oil and all kinds of mixtures, and for that reason we discontinued it. And we do not feel that our fleet is yet large enough to reclaim our own oil. But by running more mileage before changing it, our cost of oil has been materially reduced, last year by about 20 per cent.

We have also saved on tires. We bought a fleet of trucks in April, 1930, and had them all equipped with balloon tires and we found that we got about 25 per cent more wear or mileage on the balloons than we did on the high pressure. Naturally that reduced the cost of tires.

Some interesting figures are also available on truck operation, such as package delivery miles per gallon—8½; furniture—7, with 3,633 stops; amount of deliveries per truck, for one month—4,078; cost per package delivered—10.1 cents; cost (without salaries) of trucks operating, per mile—11.1 cents.

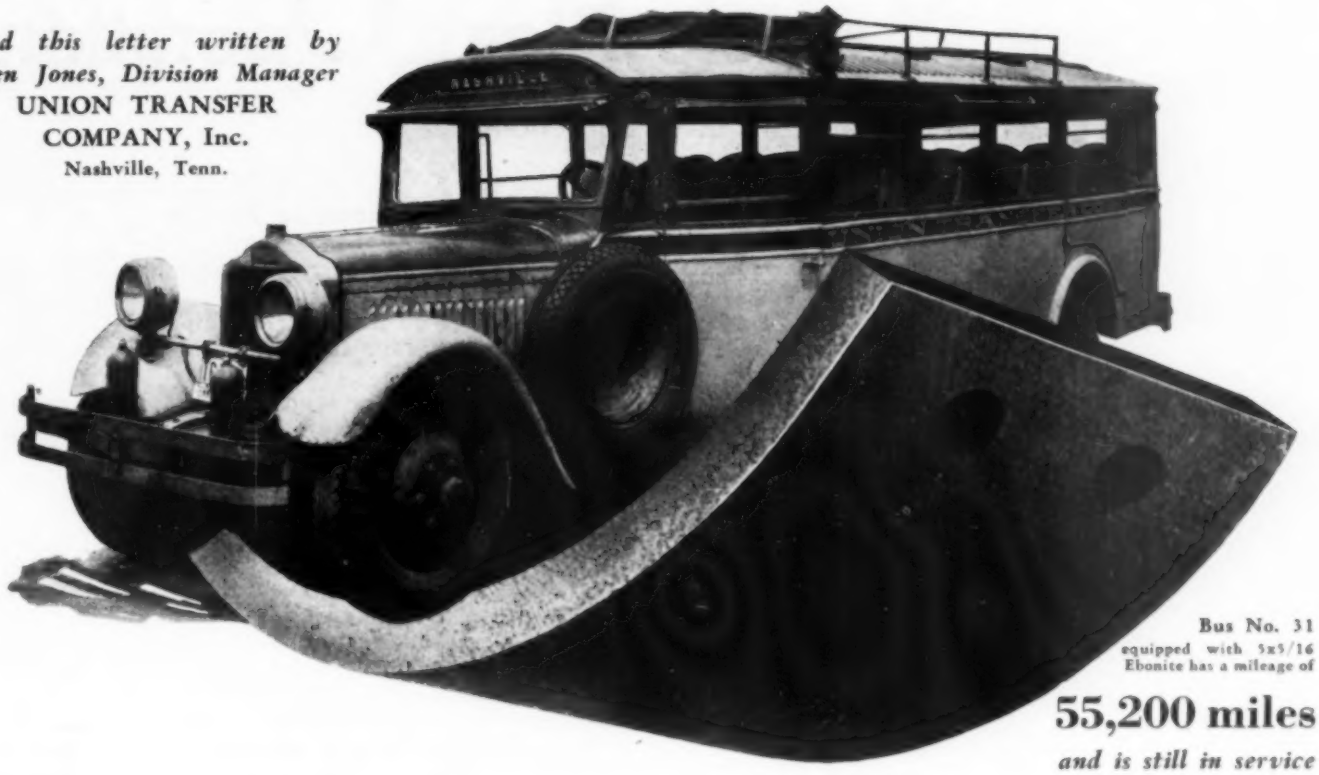
A drivers' report card is used, on which the driver makes a report daily of the condition of his truck, which is checked by the superintendent as a double check on the garage. Of course, a daily inspection is made of the truck every day, including body, engine, etc. A daily garage report is also used, as illustrated, to provide a working record of each truck and the fuel consumption, etc.

All delivery trucks are garaged in the new warehouse of the store, where the trucks are backed up to the load-

(*Please turn to page* 40)

"Since we installed the first Ebonite . . . "

Read this letter written by Allen Jones, Division Manager
UNION TRANSFER COMPANY, Inc.
Nashville, Tenn.



Bus No. 31 equipped with 5x5/16 Ebonite has a mileage of

55,200 miles

and is still in service

Ebonite BRAKE LINING

Ebonite combines the best features of *all* linings — is woven, molded, compressed, baked and ground. It is made to a new formula; by a patented process; contains more braking substance and far less asbestos than previous linings. It gives long service and a soft, firm pedal all the way. It cuts brake costs by minimizing replacements, adjustments and by saving brake drums.

Fleet operators are standardizing on Ebonite wherever tested. The following letter gives a typical "experience".

UNION TRANSFER COMPANY, Inc.
General Offices
517 Commerce Street, Nashville, Tenn.

Consolidated Coach Corporation
Lexington, Kentucky

Att'n: Mr. R. H. Swope
Reg. Mgr., Lines North
Subject: Ebonite Brake Lining

Dear Mr. Swope:

We installed our first Ebonite Lining on a 53 White bus which has only rear wheel brakes. This lining is still running and has delivered to date 55,200 miles and is still in service. *This particular lining (Ebonite) is the only lining we have been able to keep on the 53 White job any length of time and have good brakes.* Since we installed the first Ebonite on this 53 White, we have not used any other kind of lining on the rest of our 53 Whites.

We have one 54 White equipped with Ebonite which has delivered to date approximately 30,000 miles and looks to be about half gone, still this is guesswork about the rest of the mileage that is in this job.

The prices we have been getting on this lining here in Nashville seem to be reasonable and in line with other linings.

Hoping this information will be of service to you, I am,

Yours very truly

ALLEN JONES, Division Manager

Test Ebonite On Your Own Bus or Truck

If rated, just send the make and model on your letterhead and we will ship on memo bill. If Ebonite doesn't prove the best lining you ever had, send it back.

L. J. MILEY COMPANY
INCORPORATED
1466 S. Michigan Avenue, – Chicago, U.S.A.

Say "I saw it in FLEET OWNER"—It Helps!

This Business of

Motor Vehicle Fleet Operation

By E. E. La Schum,

Manager, Automotive Department, Railway Express Agency, Inc., New York City

Article IV—Determining Future Operation and Maintenance Policies

ACCURATE cost records and persistent supervision of maintenance methods are worthless unless they produce results. Proper maintenance of automotive vehicles is nothing more or less than a suitable housing, tool and stock facilities, plus adequate personnel. Housing is generally the garage and shop combined. Location is of prime importance.

In connection with this subject, it is interesting to note the downward trend of our fleet maintenance costs in our New York City fleet. Here is a record of what has been done there during the past 3½ years:

Downward Trend of Maintenance Costs in New York City Dept.

Period	Gasoline Trucks Average Maintenance Cost per Truck	Electric Trucks Average Maintenance Cost per Truck
First ½ 1929	$542.59	$367.11
Last ½ 1929	522.07	361.79
First ½ 1930	511.09	323.62
Last ½ 1930	426.14	230.63
First ½ 1931	385.14	228.86
Last ½ 1931	372.33	202.48
First ½ 1932	384.17	194.17
Total Reduction in 3½ years	158.42 or 29.20%	172.94 or 47.11%

In determining future policies, practices and plans, we, in the Railway Express Agency, have a questionnaire, which includes some of the following points:

1. Is the proper equipment assigned to the operation? This subject discussed in many conferences, is considered actually in its full meaning. The answer to the question depends on the number of vehicles and make of vehicles employed on a given job, the total tonnage and the adaptability of the various sizes of bodies to the job in hand.

2. Is this equipment used on routes to which it is best adapted? Of course, Numbers 1 and 2 go together and the same answer would apply.

3. Are the garages properly located? A typical answer to this question, in let us say Newark, N. J., would read as follows: "The distances between the garages and the various terminals were measured for both time and mileage and these showed that the average terminal mileage is 1.6 miles and averages approximately 10 minutes running time between terminals. We have two garages at Newark; one located at Oriental and Ogden Streets, where we accommodate approximately 18 gasoline trucks. The remainder of this equipment is stored at the Company's terminal at the Central R. R. of New Jersey.

All of this equipment, however, is serviced at the first-mentioned garage on a scheduled basis. In this building we also maintain a unit repair shop which is equipped for chassis repairs, ordinary body repairs and painting. The other garage is located at 599 Ogden Street, where the electric equipment is stored and given general garage attention as well as minor repairs and recharging."

4. Show rental per truck.

5. Self or outside maintenance? If garage service is done by our own help, is the cost excessive and could it be done more economically by an outside garage? Or vice versa?

6. What help to use? If garage service is done in an outside garage, could it be done more economically with our own forces? The complete answer and analysis of these three questions brought forth much information. It indicated that our rental was $5.92 per truck per month. An investigation brought out the fact that outside service would cost $18.00 per vehicle per month, with an additional cost of $4.00 for washing and greasing, or $2.00 each, making a total of $22.00 per month per vehicle. This work is now being done by us at about $1.50 per washing and greasing. Including all of the space and our light, heat, water, etc., we are doing the job for about $15.00 per month.

7. Supervision of repairs. If repairs are made by our own forces, is proper supervision exercised, and are the mechanics qualified for the work assigned to them? Could repairs be made outside more economically? A complete analysis of this question requires several typewritten pages, several charts, a check-up of every man employed, a check-up of the work done by our own forces and the work sent out. This survey, incidentally, brought forcibly to our attention the fact that an improvement could be made and it was made.

8. What help to use for repairs? If repairs are made outside, could we do them with our own forces for less money? This is answered above.

9. Plan for policing gas and oil purchases. Our survey also completely covered that part of this most important question.

10. Greasing and oiling schedules. Are schedules in effect to insure proper greasing and oiling at all stated periods, with a check-up by our own people? A part of the answer to this question reads as follows: "I personally examined most of the equipment and found it to be well lubricated. There can be some improvement in the washing and this has been called to the attention of the Garage Superintendent who will improve the condition."

And so we can go on. Every question is made a study in itself, such as: Advertising frames; How spare tires are handled; Is the stock of parts, material and sup-

(*Please turn to page* 40)

A Series of Practical Fleet Maintenance Articles Prepared from a Paper Recently Read Before the S. A. E. Transportation Meeting

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THE Cincinnati Street Railway Co. keep a strictly accurate record of spark plug performance. Their mileage figures are a mighty tribute to the long-life dependability of Bosch Pyro-Action Spark Plugs. Their maintenance cost records testify, for a 12 months period, that Bosch Pyro-Action Spark Plugs on their fleet of buses, are averaging 35,494 miles each.

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The stand we've taken on the question of an "all-purpose" braking material is well known throughout the trade.

It was Thermoid engineers who developed brake linings with different frictional qualities for different types of brakes. This meant several types of lining but it provided the most satisfactory line of braking materials on the market to date.

From their research work with many linings to confine friction within certain limits, Thermoid engineers now astound the automotive world by announcing that they have learned how to *control friction* under all normal conditions in one single type of brake lining.

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We didn't believe this was possible, but Thermoid engineers solved it by a secret process making this new brake lining ROAD CONDITIONED IN THE FACTORY which means CONTROLLED FRICTION ON THE CAR.

Here is an all-purpose lining worthy of the Thermoid name and the confidence of Thermoid distributors, dealers and users. Here is a soft pedal lining that is quiet . . . doesn't grab . . . won't score brake drums . . . has a constant co-efficient of friction . . . and produces a quick, even stop.

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The NEW
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F-M-L
(Flexible Molded Lining)
BRAKE LINING

ROAD CONDITIONED IN THE FACTORY

By Lieut. Geo. Andrews,
Motor Vehicle Homicide Squad, Police Department, City of New York, N. Y.

What Constitutes "Adequate" Brakes?

Police Official Gives His Department's Definition of "Adequate Brakes" and Stresses the Importance of the Oft-Neglected Emergency Brake

THE Motor Vehicle Homicide Squad of the Police Department of the City of New York, sometimes referred to as the "Brake Squad," plays an important part insofar as its relations with automotive fleet operators are concerned. Operators in Greater New York should be entirely familiar with its functions and duties; operators in other sections of the country will no doubt also be interested, as will other municipalities throughout the nation. I will briefly describe the workings of this unit, and its idea of what actually constitutes the much abused term, "Adequate Brakes."

The Motor Vehicle Homicide Squad is *not* a traffic squad; neither is it a brake squad for the wholesale inspection of brakes during their normal operation on a vehicle. It makes no arrests and gives no summons. It is, rather, an *investigating* squad, whose duty it is to ascertain the cause of every motor vehicle accident (in New York City) in which a person has been killed or seriously injured on a public highway. Of course, the inspection of brakes, *after* the accident, plays an important part, but that is not all.

After each accident of a fatal nature, the squad (or some branch of it) makes the required investigation. In order to get the complete picture, our men must find out the condition of the traffic lights at the time; the immediate traffic conditions; whether or not the car was parked; how far away the driver observed the person before he struck him; and all the other various factors that go to make up an investigation.

At the conclusion of this, the condition of the vehicle is taken into consideration. All mechanical defects (if any) are noted. If the vehicle is in perfect (safe) operating condition, this is also noted. All particulars of the accident are then laid before the Magistrate—how the accident happened, just what the conditions were at the time, whether or not the condition of the vehicle played any part in the accident, etc. This enables the Magistrate to determine whether the accident was caused by the vehicle itself, or by other surrounding conditions, and helps him to properly place the blame where it belongs.

In order to test the brakes of a vehicle that has figured in an accident, a decelerometer is used to measure the maximum braking force. There was considerable error obtained when using a tape measure, that it became imperative to use a more accurate means—the decelerometer. Fleet maintenance men know that if they make a tape measure test and then make a decelerometer test of the same vehicle, they will get two different measurements. We found this condition to be prevalent.

Therefore, we use the decelerometer and take the maximum braking force, regardless as to what the skid of the vehicle is. It is interesting to note that (when using the decelerometer) where the coefficient of friction is maintained throughout the entire stopping period, the tape measure reading will be almost the same.

The stopping distance charts in use by our Police Department, for brake tests, are based on a speed of twenty miles per hour. When looking up our New York State Law on brakes, we found that it read: *"Every motor vehicle operated or driven upon the public highways of this State shall be provided with adequate brakes."* But it doesn't tell you what "adequate" brakes are. Therefore, the first thing we did was to establish that. Adequate brakes, according to General Order No. 19 of the New York City Police Department, should be as follows:

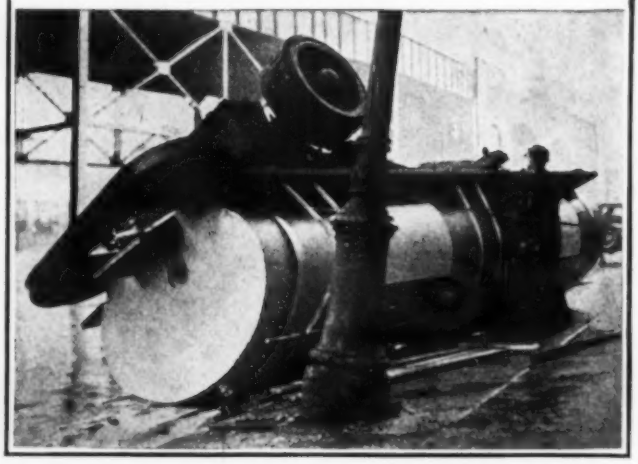
"Every motor vehicle operated in the City of New York and capable of a speed in excess of ten miles an hour shall have a service brake capable of decelerating the vehicle when moving at a rate of 20 miles per hour, so that it will stop within 43.3 feet, if equipped with 2-wheel brakes. And within 22.2 feet if equipped with 4-wheel brakes; this distance to be measured from the point where such braking is first applied. Every such vehicle shall be equipped with an emergency brake operating independently of the service brake mechanism, to be capable of decelerating the vehicle when moving at a rate of 20 miles per hour, so that it will stop within 50 feet of the point where such a brake is applied. Any such vehicle not so equipped shall not be deemed equipped with adequate brakes."

In short, 43.3 feet for 2-wheel brakes, 22.2 feet for 4-wheel brakes and 50 feet for the emergency brake. However, that in itself would not be the proper definition, unless certain roadways had to be used in order to get these results. Now we will go on to describe what the roadway has to look like, where the test is to be made. Again quoting from General Order No. 19, we find:

"All brake tests shall be made on an asphalt roadway which is substantially level,

(Continued on page 18)

To analyze whether or not faulty brakes caused this accident would be a tough job, indeed, for any Homicide Squad. It is interesting to note that there was no spilled milk. The tank was an ox-welded aluminum job and the joints did not open up.—(Editor).



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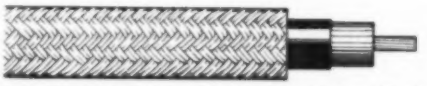

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Then the braid is saturated with special Belden moisture proofing compound.

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This new Beldenlac Asbestos Ignition Cable has been built specially to withstand the terrific heat and oil conditions of the most strenuous bus and truck service.

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Costs a little more per foot . . .
. . . but much less per mile.

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Belden

Automotive Wires and Cables

Say "I saw it in FLEET OWNER"—It Helps!

WHAT DO YOU MEAN "ADEQUATE"? (*Continued*)

dry, clean and free from loose material and holes. For the purpose of a test, a roadway may be assumed to be level when the vehicle will remain stationary with all brakes released and the transmission in neutral."

That is our definition of "adequate" brakes and is our yardstick of comparison. With reference to the emergency brake, by this is meant the hand brake. Nothing in the law says that both the service brake and the emergency brake must be independent mechanisms. There has been much discussion about the emergency brake—whether it was a parking brake or an emergency brake. Our emergency brake rating was made, based upon tests with the weakest type of emergency brake we could find.

In making a brake test properly and to make sure of the elimination of all human errors, the use of the decelerometer is required. For instance, if we went out to test a vehicle and took the old system of drawing lines on the pavement 37 feet apart, we wouldn't be positive, even though we hit the line accurately and stepped on the pedal, as to what time those brakes came into contact with the drums.

Assuming that we are going 20 miles per hour, or traveling 29⅓ feet per second. If the brake failed to operate until a second after we pressed the pedal down, we would travel 29⅓ feet before the braking force was applied. We would then have an error of 29⅓ feet to begin with, and the brake might be called defective, whereas it never had a chance to be working at all. This is only one of the possible errors that we can get by use of the tape.

In making tests we try to be fair. Where a vehicle is equipped with air brakes, or a vacuum booster, etc., we have to test all of these pieces of equipment for proper functioning. Where the air brake is used, we check the entire system in the same manner as do the Bendix-Westinghouse engineers. Likewise with the vacuum brake, where we use the mercury gauge. In many cases we find the booster to be working properly and the trouble actually in the brake shoes or in the adjustment. In 95 per cent of the cases, where brakes are faulty, it is on account of lack of service attention and supervision, rather than on the design of the braking system.

Don't expect to get good braking performance with scored or out-of-round drums. If you are not equipped to do this work, you will find that most automotive jobbers are.

"We have taken the words "Parking Brake" out of our dictionary," says Lieut. Andrews. "Every vehicle should be equipped with an effective hand brake that will stop the vehicle in any emergency."

If we are more less lenient in our allowances, it is because we take into consideration the braking equipment on each vehicle. We don't expect a vehicle with 2-wheel brakes to stop as short as one with 4-wheel brakes.

When this squad was started we ran into a great many defective emergency brakes in the taxicab fleets. By getting together with the service departments of the various companies we were able to correct 95 per cent of them mostly by proper servicing alone. This is a rather broad statement, but we have done it.

With reference to trucks, we have been asked whether our stopping distance requirements apply to trucks loaded to full capacity or otherwise. The answer is yes. In other words a 100% brake is one that will control 100% of the vehicle's weight (together with what load it might be carrying) at any time.

The number of wheels is also often brought up. It doesn't make any difference if there are eight axles. The brakes should be able to control the weight being carried and the weight could be distributed over the entire set of wheels. If the front wheels of a vehicle are not braked but there are other braked wheels besides the two driving wheels, this is sometimes considered a two-wheel brake. However, we first examine the unit (such as trailer, tractor, etc.) before making any ruling. Almost every condition is different, so we have not attempted to set up ironclad rules on complicated braking set-ups.

We have taken the words "parking brake" out of our automotive dictionary. We would rather call it "emergency brake" for that is just what it should be. Those

(*Please turn to page* 42)

AMERICAN BRAKEBLOK

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EITHER IN PERFORMANCE OR CHARACTER

ONLY in American Brakeblok do you get the advantages of economy and performance which have made this new-type brake material famous—for American Brakeblok is made under exclusive patents which prevent its duplication by any other manufacturer.

American Brakeblok gives quicker, safer stops, with a complete absence of grabbing. There is a constant renewal of braking surface which insures uniform performance. American Brakeblok does not swell or burn out. It wears longer and keeps brakes in better adjustment.

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Say "I saw it in FLEET OWNER"—It Helps!

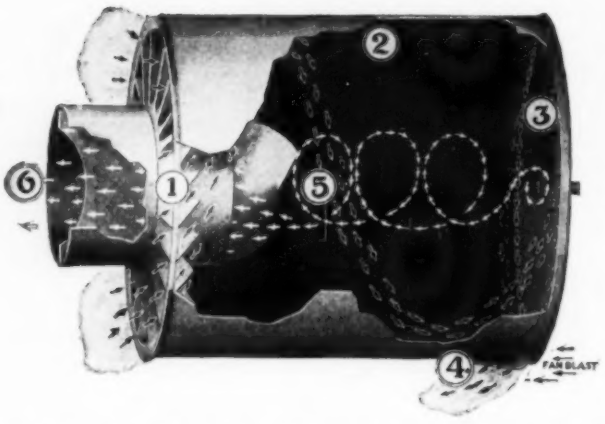
Air Cleaners Must Be Serviced

(*A "How-to-Do-It" Article*)

By Sumner S. Howard

ENTRY of road dust into engines will cause rapid wear of cylinders, pistons and piston rings, resulting in poor performance and necessitating expensive repairs. To safeguard against this, air cleaners are used.

Today, practically every make of car, bus and truck, also industrial equipment, is fitted with an "oil wetted" type air cleaner. These cleaners require cleaning and re-oiling every 2,000 miles, and oftener when operated under extremely dusty conditions.



This type of air-cleaner is self-cleaning. Accumulated dust is forced through small outlet (4), the spiral travel of the dust bringing it to the rear circular end.

Years ago when air cleaners were first introduced, all of them were of a design that needed no cleaning or attention during the life of the car. Present-day cleaners, however, are much higher in efficiency, of improved design, and must be cleaned periodically.

Today, many air cleaners are built in combination with carburetor intake silencers. In some cases the cleaner can be detached from the silencer, but in other cases it cannot.

The cleaner element on some makes is composed of a dense mass of flat copper wire, which is woven into a coarse mesh and then saturated with oil. The dirt and dust in the intake air adhere to these oily surfaces and only clean air enters the engine.

Oil-wetted cleaner of the louvre type. This type should be installed so that the louvres open away from the fan blast.

In addition to the carburetor, another point at which much abrasive dust may enter an engine is through the crankcase breather tube. On modern engines having crankcase ventilation, much air is actually sucked into the crankcase through this pipe. A crankcase breather cleaner prevents harmful dust from entering the crankcase through the breather tube. This cleaner should also be cleaned every 2,000 miles or oftener.

The following procedure for cleaning and re-oiling various types of air cleaners is recommended.

Combination Air Cleaner and Silencer

1. Integral Type. (one-piece)

In this combination, the air cleaner is an integral part of the silencer. Remove the entire assembly from the carburetor and wash the accumulated dirt from the cleaner element by plunging it up and down several times in a can of gasoline or kerosene. Then re-oil the cleaner element by dipping it in heavy cylinder oil, letting excess oil drain off. Reassemble to the carburetor in original position.

NOTE: A hair-felt pad is assembled in some of these silencers to remove carburetor hiss. Care should be taken that this pad is NOT dipped in gasoline or oil during the cleaning operation.

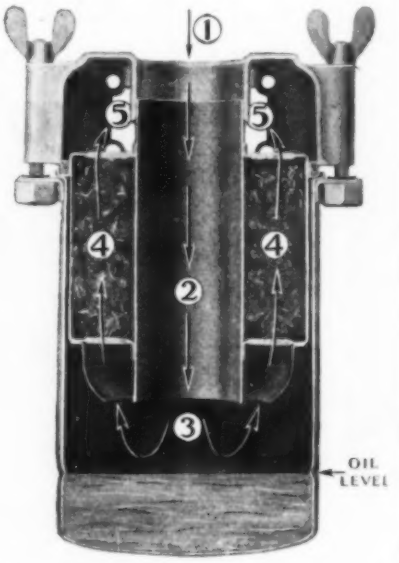
2. Detachable Type.

In this type, the cleaner element can be detached, usually without disturbing the rest of the assembly. Wash the accumulated dirt from the cleaner element by plunging it up and down several times in a can of gasoline or kerosene. Then re-oil the cleaning element by dipping it in heavy cylinder oil, letting excess oil drain off. Reassemble to the cleaner in original position.

3. Semi-Detachable Type.

In this type, the cleaner element is integral with the silencer, but the hair-felt pad is detachable. Always remove this pad before cleaning and re-oiling the element. Wash the accumulated dirt from the cleaner element by plunging it up

(*Cont. on page 22*)



This type of air cleaner makes use of three principles. Air enters at (1), is suddenly reversed at (3) and passes through oil-wetted mesh (4).

"PAID FOR ITSELF IN 3 MONTHS"

reports the Eastern Air Transport, Inc. which has 2 Skinner Reclaimers in use—and in one year renewed over 15,000 gallons of oil. Whether you operate a fleet of trucks, taxicabs, busses or 'planes—you'll find Skinner Reclaimers soon pay for themselves by reducing your oil bills 40 to 60 percent. Use the coupon and find out how much you can save in actual cash and oil by renewing crankcase drainings.

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Position.....4-33

SOME FACTS ABOUT AIR CLEANERS (*Continued*)

State Highway Department truck equipped with air-cleaner of the oil-washed type.

and down several times in a can of gasoline or kerosene. Then re-oil the cleaning element by dipping it in heavy cylinder oil, letting excess oil drain off. Replace the felt pad in position and place the entire assembly in original position.

Straight Air Cleaners

1. Oil-Wetted Air Cleaner.

These cleaners are usually constructed in open type and louvre type. Remove cleaner from carburetor and wash off accumulated dirt from the cleaner element by plunging it up and down several times in a can of gasoline or kerosene. Then re-oil the cleaning element by dipping it in heavy cylinder oil, letting excess oil drain off. Reassemble to carburetor in original position.

2. Crankcase Breather Type.

With crankcase ventilation now in general use, many engines are equipped with crankcase breather caps embodying a small oil-wetted cleaner element to protect the crankcase oil from road dust. These air cleaner-breather caps are made in several different types, but the operation of cleaning them is alike. To clean, remove the cap and wash it in gasoline or kerosene, then re-oil by dipping in heavy cylinder oil.

3. Triplex Air Cleaner.

This is a large heavy-duty cleaner used on trucks, tractors and some passenger cars that are operating under extremely dusty conditions. To clean this type, loosen two wing nuts and remove the oil reservoir and cleaner element. Wash the element in gasoline or kerosene, also empty the oil reservoir and wash it out with gasoline or kerosene. Re-oil the element by dipping it in heavy cylinder oil. Also refill the oil reservoir to the indicated level with fresh oil. Reassemble in original position.

In this type of air cleaner, the density of the copper mesh has been so designed that, when all the oil in the oil chamber has been used up, the dust which then accumulates on the copper mesh will cause a very sudden increase in restriction, or a very sudden drop in air flow to the carburetor. This "plugging" is a particular feature of this cleaner, because the operator will be immediately warned by a sudden change in performance of the engine, and the only way its performance can be brought back to normal is to clean the air cleaner. This feature eliminates the danger of neglecting to service the cleaner.

Some time ago a series of interesting tests on air cleaners were conducted by an engine manufacturer, in collaboration with an air cleaner maker. The actual operating conditions, as far as possible, were reproduced in these tests. The photograph at the bottom of this page shows the set-up that was used.

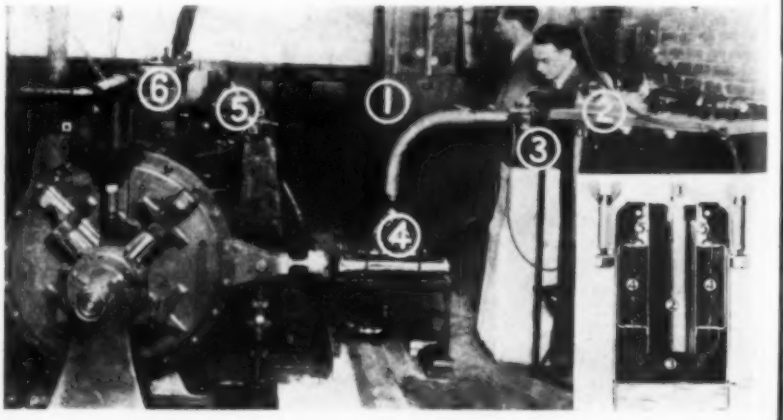
The tests covered a period of several months, during which time an ingenious dust-accumulating machine was employed to load the air going to the carburetor with various kinds of dust and dirt found in the several districts of the country, and under the various conditions where engines would be normally required to operate.

The conclusions reached as a result of these tests were that the oil-reservoir type of air cleaner is best suited for heavy-duty service; the tests also showed that this type of filter effectively prevented wear in those portions of the engine ordinarily affected by dust conditions.

It goes without saying, therefore, that every piece of equipment powered with a gasoline engine, whether it be a bus, truck, tractor, agricultural or industrial machine, is faced with the problem of overcoming the harmful effects of excessive dust conditions, either in the shape of ordinary road dust or that which is present in quarries and the like, or during building operations. Under certain dusty conditions, it is possible for an engine to be literally "worn out" in a week's operation, and to meet this problem a highly efficient air cleaner is essential.

Should fleet operators desire further information on any of the air cleaners illustrated within this article, drop a line to the Editor and we shall be glad to see that you get catalog sheets, prices and other information covering same, without obligation.

A Thorough Test:



HOW the air-cleaner tests were made. (1) is the air-flow meter which measured the cubic feet per minute of air going through the cleaner to engine. (2) is the dust-feeding machine. (3) is the air-cleaner under test. (4) is an absolute air-cleaner that catches any dust not caught by the cleaner under test. (5) is the carburetor and (6) is the engine. The inset shows a cut-away view of the air-cleaner under test.

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How to Lubricate Outdoor Equipment

By Owen C. Jones

Of Interest to Contractors, Excavators, Road Builders, and Other Fleet Operators Having Equipment Exposed to Adverse Weather Conditions

OUTDOOR equipment, as a whole, embraces a wide field. It includes automotive equipment of all kinds, industrial machinery, road building, excavating, construction and handling equipment as well as pit, quarry and mining machinery. During the limited operating season through which most equipment of this type is in use, some insurance against breakdown due to failure of lubrication is essential.

The fleet owner, the roadbuilder, excavator and contractor, the pit and quarry operator must keep equipment working at top speed and maximum efficiency during the busy season. Delays and injury to equipment due to faulty lubrication must be avoided.

Outdoor equipment is subject to severe usage and heavy shocks. It is exposed to extremes of heat and cold; to rain, snow, and ice; to penetrating dust, grit, and mud. Maintenance of such equipment therefore, involves a consideration of the individual lubrication requirements in each case. Further than this, it becomes necessary to know what kind of lubricant will best fulfill the requirements and have the ability to provide efficient and economical protection at all times.

A good grease not only affords operating insurance, but also will have the properties of a protective coating.

Exposed parts of drag-lines, shovels and other outdoor automotive machinery require good protection from grit, water and foreign matter.

In the automotive field, lubricants must effectively resist dust, water, and mud as well as extremes of temperature and weather conditions. It is therefore of interest to see what type of grease is best for use on those parts which are exposed to these conditions.

For a chain drive, for instance, operating under normal conditions, a relatively fluid grease with maximum pressure-resisting qualities, low cold test, and maximum silencing power is required. Under severe and dirty conditions, the same part requires a very heavy, thick lubricant which adheres firmly to the bearing surfaces and provides efficient lubrication, at the same time preventing damage from gritty dust and dirt. This is a very heavy and sticky grease.

Most other automotive parts are fairly well protected from dirt and mud during operation. This case serves to illustrate the fact that there are parts of such equipment which demand special consideration.

Exposed bearings are another machine part which demand particular consideration. Where high temperatures or occasional water showers are encountered, greases with a low coefficient of friction and a fibrous, elastic structure which will maintain a strong film of lubrication are essential. This type of grease also should emulsify slightly with water, enabling it to lubricate wet surfaces efficiently. It is not a grease intended for continual use under water.

Cable lubrication demands a grease that is not affected by water, acid or alkaline. It must be capable of operating under water or exposed to severe weather and to extremes of heat and cold without hardening, cracking or peeling off. It should be very adhesive and possess high pressure-resisting ability to prevent wear on sheaves and internal frictional wear on strands. This type of grease should also assure good protection to wire ropes and cables while not in use.

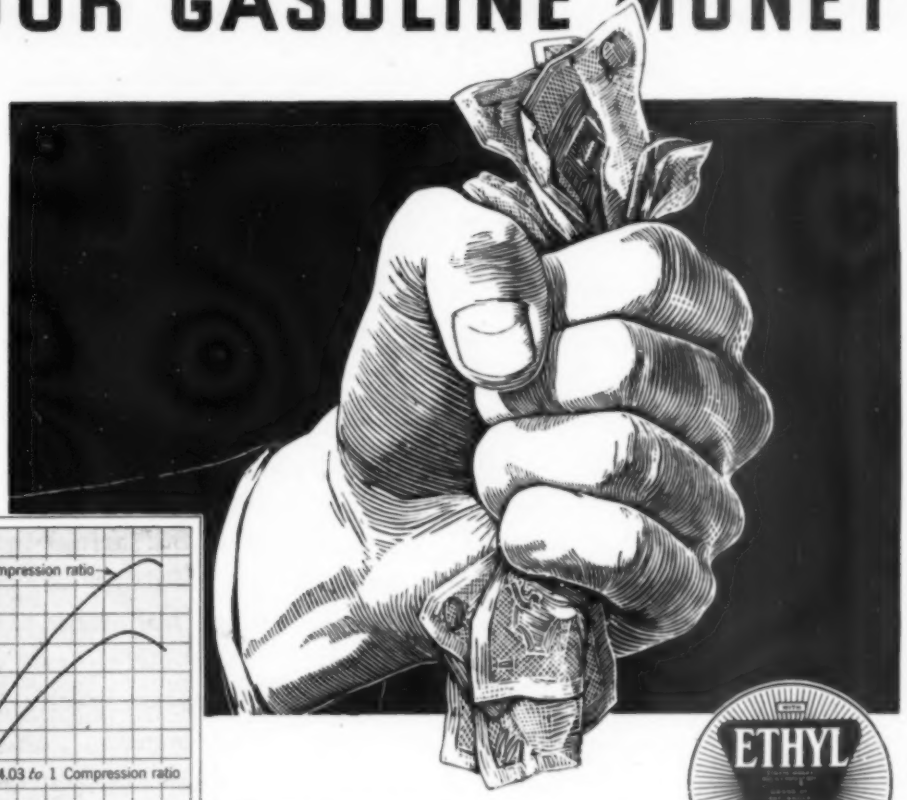
Chain lubrication presents problems of greater diversity than those encountered in most cable applications. While enclosed chains permit the use of fluid lubricants, open chains exposed to dirty conditions require a very heavy, thick lubricant capable of operation under water.

Gear lubrication is more difficult, in some respects, than bearing lubrication. Concentration of load on very small tooth areas results in extremely high unit pressure without any mechanical forces which would tend to maintain the lubrication film, as is found in a revolving bearing. Here it is essential to use a grease rich in suspended soft solid or plastic substances, such as pure electric furnace graphite, which will cushion the contact surfaces of the teeth with a film of lubrication and which will adhere firmly either in motion or at rest. For this surface there should be used a fluid grease, which has a soft, spongy, clinging nature and a very low coefficient of friction and which will leave a thick coating on every tooth no matter how long the gears are idle.

For spiral or open gears subject to heat or high centrifugal action, or on heavy, slow moving chains and open worm gears, a very adhesive, yet plastic, soft solid gear grease should be used. For power shovel gears or other gears where dusty or dirty conditions prevail, a very heavy and sticky grease which will prevent damage

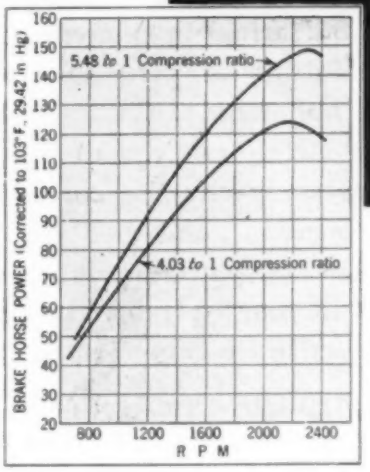
(*Please turn to page* 42)

SQUEEZE MORE *Power* OUT OF YOUR GASOLINE MONEY



WOULD IT surprise you to know that the average truck on the road today is unnecessarily wasting 15% to 25% of its fuel? That is not a theoretical estimate obtained by comparison with visionary "paper" trucks. It is a definite conclusion drawn from engineering demonstrations.

Engines are now being built and sold by leading manufacturers that *squeeze* 15% to 25% more miles out of every gallon of fuel. They get this extra horsepower by the simple expedient of putting greater pressure on the gasoline vapor *before* it is burned. Inside the engine, gasoline vapor is like a steel spring. The harder you squeeze it, the more work you get out of it. *High compression* takes advantage of that fact.



BRAKE HORSEPOWER: *With a compression ratio of 4.03 to 1, the engine develops a maximum brake horsepower of 124 at 2125 r. p. m. By installing pistons which give a compression ratio of 5.48 to 1, the engine develops 149 brake horsepower at 2300 r. p. m.—without any other changes in construction or adjustments with the exception of spark advance, which was set for maximum power in each case.*

Glance at the chart above. It shows the greater horsepower that increased compression ratio gave to one typical heavy duty engine.

That was in the laboratory. On the road, high compression wins a *double* victory. It *improves* performance AND *lowers* operating cost.

It has been definitely shown that high compression vehicles using Ethyl Gasoline cost less per mile to operate than duplicate vehicles with identical engines (except for compression ratio) using regular gasoline.

If you are looking for better performance and a way to carry bigger pay loads, get the facts on high compression. Engineers of the Ethyl Gasoline Corporation will be glad to send you further data on tests and the benefits of high compression in heavy-duty equipment. Write Ethyl Gasoline Corporation, Chrysler Building, New York City.

Ethyl fluid contains lead. © E. G. C. 1933

Say "I saw it in FLEET OWNER"—It Helps!

Announcing

A NEW AND REMARKABLE ACHIEVEMENT IN GEAR LUBRICATION

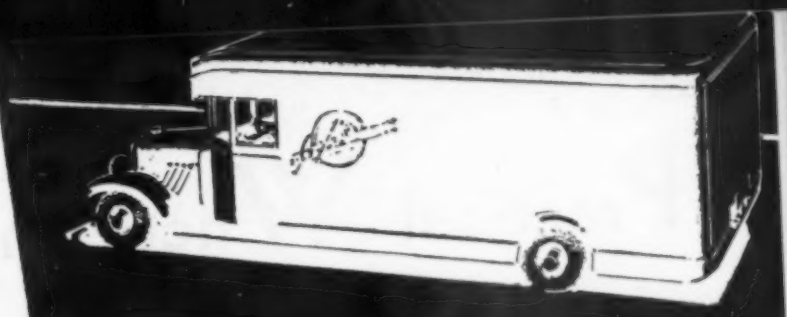
Tests show consumption reduced 75% to 85% with KENDALL O. K. GEAR LUBE

WHEN we told bus operating men the results obtained with the new Kendall O. K. Gear Lube, they could hardly believe their ears. True facts that they were, yet they sounded like wild claims rather than actual records of performance. And so for month after month we have delayed public announcement until more and more tests could be made under actual operating conditions. Now these tests are completed . . . tests that were made in all kinds of equipment under all kinds of operating conditions . . . and again we have proved that the claims we make for the new Kendall O.K. Gear Lube have been under-stated rather than over-stated. Such results have never before been achieved or even approached.

This new Kendall O. K. Gear Lube is the result of an entirely new process of refining and seems to be absolutely devoid of any breakdown point. So we bring you this new gear lubricant with full confidence that it will effect lubrication savings of very vital importance to you. And in addition, savings in differential and transmission replacements of parts that will be even far more important.

We merely ask you to try it . . . to let our engineers specify the correct grade for your equipment . . . and then see for yourself that Kendall O. K. Gear lubricant will actually effect in your operation savings such as these from which we quote below.

KENDALL REFINING COMPANY
BRADFORD, PENNA.



TIVOLI GARAGE
333 Jones Street
Phone Fillmore 1949

WILLIG BROS. AUTO RENTAL

AUTOMOBILES RENTED WITHOUT DRIVERS

Main Office: 1440 MARKET STREET
NOW ONE MILE MORE
to Auditorium Garage

Dec. 5, 1932

Kendall Refining Company
Bradford, Pa.

Gentlemen:

We operate two (2) five (5) ton white trucks, model 58-J between San Francisco and Los Angeles. These trucks haul trailers and the total weight averages about eighteen (18) tons.

Before using Kendall OK Gear Lube, we had trouble with excessive heat in the transmission and foaming of the grease. Up to now we have used Kendall Gear Lube, approximately five thousand (5000) miles without adding any, and find it keeps our transmission much cooler and does not foam. It is proving very satisfactory in every way.

Very truly yours,

WILLIG BROS.
By

LJW
I
O

WILSON-BARBER AUTO CO.

DISTRIBUTORS FOR
GENERAL MOTORS TRUCKS
SIOUX FALLS, S. DAK.

November 16, 1932

Kendall Refining Company
Bradford, Pa.

Gentlemen:

We have just completed a test on the sample of new KENDALL O.K. GEAR LUBE and are pleased to advise that it is very satisfactory in every way. The sample we have taken out has been used 10,000 miles in a Mac Tractor Truck with 125 H.P. Hercules motor pulling a load of 22½ tons.

No additional GEAR LUBE was added during this 10,000 mile test.

This machine has two transmissions and your KENDALL O.K. GEAR LUBE WAS USED IN BOTH TRANSMISSIONS and in the DIFFERENTIAL.

Previous to our using KENDALL O.K. GEAR LUBE we had considerable trouble because of other gear lubricants foaming and setting up a pressure, and leaking out. With Kendall O.K. GEAR LUBE this condition is not present.

Very truly yours
WILSON-BARBER AUTO CO.
By Fred H. Stevens
Service Mgr.

FHB:RS

"We Smile at Miles"

GILES EXPRESS

DAILY TRIPS TO NEW YORK
LONG DISTANCE HAULING

COAST TO COAST

Jan. 27th, 1933

Kendall Refining Company
Bradford, Pa.

Gentlemen:-

I have been using your 4-00 O. K. Gear Lubricant in my Indiana two ton truck, operating on a daily schedule, covering approximately one hundred and fifty miles per day.

This piece of equipment has been driven eleven thousand miles since being filled with O. K. Gear Lubricant and so far it has not been necessary for us to add any additional lubricant. With the product we have used heretofore, we have found it necessary to add one pound of gear grease every four thousand miles.

We find that the operation of the equipment is smoother, that there is no difficulty in shifting gears during cold weather and that there is an indication of any channeling, foaming or heating in

We are
of our
result

Chicago Trucks

Manufactured By
ROBERT M. CUTTING COMPANY
400 NORTH OGDEN AVENUE
CHICAGO

PHONE HAYMARKET 1040

JANUARY 10th, 1933

Kendall Refining Company
Bradford, Pa.

Gentlemen:-

We are pleased to report to you that we have used your O.K. Gear LUBE in many of our trucks with the best of success.

We have particularly watched this lubricant in the six-wheel dual drive trucks where metallic seizure was most likely to result from metal to metal contact under heavy loads and under great strain and heat, and we are glad to say that upon inspection we found no "scuffing" or "metal pick-up" or any excessive wear, and we feel that at last we have found a dependable lubricant that we can count on and recommend to our users.

In this connection we will say that this lubricant has taken care of and done the work where the best conventional lubricants have fallen down.

Yours very truly,
ROBT. M. CUTTING CO.
Service

ADIRONDACK STAGES, INC.

241 WEST 42ND STREET
NEW YORK CITY

December 16, 1932

Kendall Refining Company
Bradford, Pa.

Gentlemen:

On October 15 we started using Kendall OK Gear Lubricant in both the transmission and differential of our No. 17 White Bus. We discovered some very interesting results.

All of our buses are thoroughly greased every 2000 miles. Usually it is necessary to add three pounds of grease to the differential and transmission. Since using Kendall OK Gear Lubricant, we have to add one pound every 4000 miles. This is a saving of five-sixths, and needless to say, is greatly beyond our expectations.

Very truly yours,
ADIRONDACK STAGES, Inc.,

LVS VK

KENDALL

GEAR K LUBE

Practical Wheel and Axle Alignment

(*How to Check Front Axle Caster*)

By Will Damman

WE all have heard of the expression, "caster," which is the backward tilt of the front axle. Comparatively few fleet service men, however, understand the entire mechanics of easy steering;—some actually believe that the steering must be so tight that the driver always can hold the front wheels in the direction which he desires. This is wrong—the adjustment must be just right to permit a smooth coordinated functioning of the steering assembly; otherwise, an aggravated case of *bad steering* results.

Actually, the motor car, truck or bus, has been designed to steer itself through the caster angle. This has the same effect as the caster in a piece of furniture. Tilting the front axle backward tilts the top of the king-pin backward. A line through the king-pin meets the floor in front of the contact point of the tire with the floor, as shown in Figure No. 1. The front wheel then trails this point. The greater the backward tilt of the king-pins, the farther the line through the king-pin will extend in front of the wheel, and the greater will be the trailing effect.

If the king-pin is vertical, that is, has no caster, the end of the spindle swings through a straight line (Line No. 1 as shown in Figure No. 2) when the wheel is turned from side to side. When the king-pin tilts backward, the left front spindle-end falls when the wheel is turned to the left, and rises when the wheel is turned to the right, as shown by Line No. 2 in Figure No. 2.

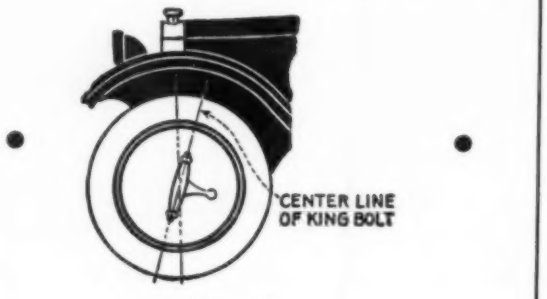


Figure 1.

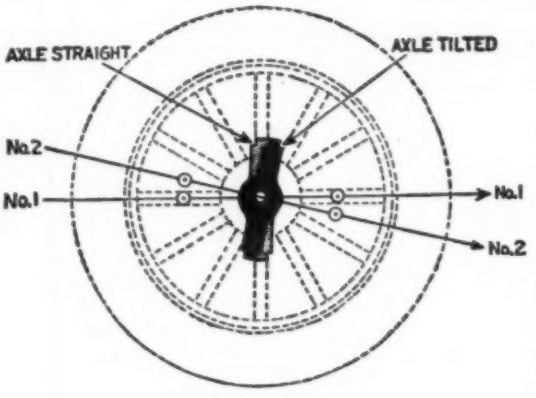


Figure 2.

The "mysteries" of Caster are explained in this interesting article on wheel alignment. And there are no "puffs" in it, either.—(Editor).

The right front spindle-end, of course, does just the opposite. While the left spindle-end falls, the right spindle-end rises and vice versa. The amount which the spindle-end rises or falls depends upon the amount that the king-pin tilts to the rear.

The easiest method of checking caster, then, is to measure the amount that the spindle-end changes as it is swung between two given points at an equal distance from the end of the spindle when in a parallel line with the axle. Since the spindle-end must be free to fall, the front axle should be jacked up so that the front wheels are free of the floor about one-half inch to obtain accurate results. With the weight on the tires, a twisting action results that is partly absorbed by the axle, giving an incorrect reading. Raising the wheels about one-half inch has a second benefit also—it gives a more normal road condition.

Caster must be checked on a level floor. If the rear wheels are on a higher or lower plane, the front wheel reading will be affected. When the car is loaded, the rear-end settles closer to the rear axle. Raising the front-end when the car is empty compensates for this lowering of the rear-end. Special alignment gauges can be obtained for checking the caster reading which must be the same on each side and agree with the manufacturers specifications which differ for practically every model and car.

This trailing action of the front wheels tends to keep the car running in a straight-ahead position without the driver constantly guiding the car. Upon making a left turn, the left spindle-end tends to fall and the right spindle-end tends to rise. Since the spindle-end cannot come any closer to the road, being held in position by the wheel, the end of the axle is forced upward on the left side and downward on the right side. This tends to bank the car in the opposite direction of travel. This force tends to bring the wheels back to a straight ahead position after the wheel is freed and thus guides the car back to a straight ahead position.

Wheels must turn freely and easily to enable the caster to guide the car. As the caster angle is given to the axle by the arch of the front springs which may change because the springs are constantly flexing and are subject to the strain of the front wheel brakes, the caster angle should be checked regularly. If there is no caster, the driver does not obtain any help in steering the car;—if there is too much caster, the car shimmies and turns hard. To maintain the original setting, frequent adjustments of caster are necessary and the quickest and most effective means is the use

(*Continued on page* 43)

There IS a Difference in TIMING GEARS!

CELORON SILENT GEARS

ARE MADE FROM RAW MATERIALS TO FINISHED GEARS IN OUR OWN PLANT. THE GEARS ARE MACHINED FROM MOLDED CELORON BLANKS. THESE BLANKS MUST PASS SEVERAL SEVERE TESTS FOR STRENGTH AND DURABILITY BEFORE THEY ARE MACHINED.

SOME INTERESTING FACTS ABOUT THE CARE AND PRECISION WITH WHICH

CELORON TIMING GEARS

ARE MANUFACTURED

Celoron were pioneers in the developing and perfecting of the silent timing gear. Consequently Celoron gears have always lead the way in engineering innovations which have made possible the manufacture of a silent gear which under normal operating conditions, is practically indestructable. The latest of these engineering accomplishments is the new "Spoke" gear just approved by STUDEBAKER for original equipment.

NO. 1. THE FIRST TEST TO WHICH A CELORON BLANK IS SUBJECTED IS TO DETERMINE THE RESILIENCY AND STRENGTH OF THE WEB. THE WEB OF A CONVENTIONAL CELORON TIMING GEAR IS OF PATENTED INTERLOCKING CONSTRUCTION. INSTEAD OF BEING BUILT UP OF LAMINATED DISCS IT IS MADE UP OF SMALL SEGMENTS WHICH COMPLETELY INTERLOCK. THE ABOVE ILLUSTRATION SHOWS THE WEB TEST TO WHICH EVERY BLANK IS SUBJECTED. THE GEAR BLANK IS SUPPORTED ON ITS RIM BY A CIRCULAR STEEL FORM AND 2000 LBS. PRESSURE IS APPLIED TO THE CENTER OF THE BLANK, PUSHING IT DOWN FROM 1/8" TO 5/16". TO PASS THIS TEST THE WEB OF THE GEAR MUST SPRING BACK TO NORMAL TRUENESS SIMULTANEOUSLY WITH THE RELEASE OF THE PRESSURE.

CELORON SILENT AND METAL TIMING GEARS ARE IMMEDIATELY AVAILABLE FROM NAPA WAREHOUSES AND JOBBERS

CONTINENTAL-DIAMOND FIBRE CO. **BRIDGEPORT, PENNA.**

Say "I saw it in FLEET OWNER"—It Helps!

Air-Steering—What It Is—How It Works

New Unit is Now Available for Installation on Any Vehicle Equipped With Conventional, Manually-Operated Steering Gear

BECAUSE of the growing tendency to place greater loads on the front wheels, proper steering control has become a growing problem. True, ratios have been increased in an effort to correct existing conditions, but this adjustment sometimes falls short of producing the desired results. Obviously enough, the problem lends itself readily to power control. Viewing the situation from this angle and realizing the flexibility of air as a power medium, Bendix-Westinghouse research engineers, several years ago, set about the task of producing a dependable Air Steering Control. After a systematic elimination of various methods and combinations, it was found that a unique application of a double-acting cylinder, controlled by an ingenious double-valve arrangement, was the apparent solution to the problem.

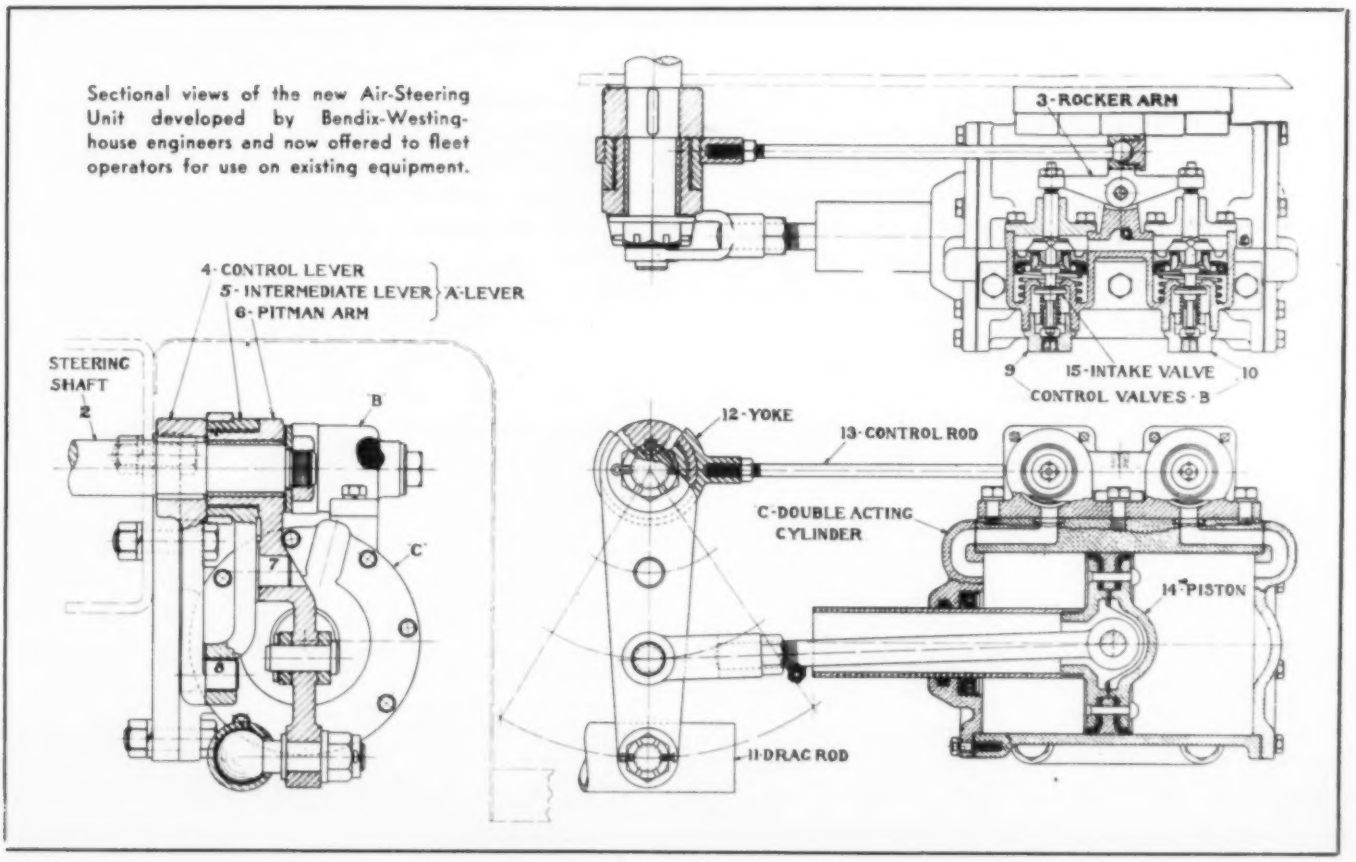
The Bendix-Westinghouse Air Steering Control consists primarily of three major parts, namely, the combination of Levers "A" mounted directly on Steering Shaft "2", Control Valves "B" and the Double-Acting Cylinder "C". (See illustration.) The Control Valves are of the self-lapping type and mount directly on the double-acting Air Cylinder, each valve controlling one side of the cylinder. The air pressure delivered to the cylinder is proportional to the force delivered on top of the Valve Piston Plunger. The valves are actuated by Rocker Arm "3", which insures that air is delivered to one side of the cylinder at a time. These valves are so adjusted that the air can be exhausted from both sides of the Double-Acting Piston simultaneously, but air pressure can be delivered to only one side at a time.

The present Pitman Arm "A" of the Steering Gear is made up for control purposes of three distinct levers; the Control Lever "4", the Intermediate Lever "5" and the Pitman Arm "6". The Control Lever "4" is fixed directly to the Steering Shaft. The Intermediate Lever "5" is fulcrumed at the Pitman Arm thru Pin "7". The lower end is connected to the Control Lever thru Pin "8". The upper end of the Lever "5" is bored slightly larger than the Steering Shaft so that a free motion is obtained for the operation of the Control Valves "9" and "10". The Drag Rod "11" is connected at the extreme end of the Pitman Arm and Brake Cylinder "C" is connected between the Drag Rod "11" and Pivot Point "7" of the Intermediate Lever "5". Yoke "12" is mounted on the upper end of Intermediate Lever "5" so that the Control Rod "13" will be kept in a straight line with the Steering Gear Camshaft.

The operation of Air Steering Control is as follows: Manipulation of the steering wheel will turn the Control Lever "4" in either direction. If the steering wheel is manipulated for a right-hand turn, the Control Lever "4" will move to the right. As there is always present a resistance to turning of the wheels, the Control Lever "4" will move the upper end of the Intermediate Lever "5" to the left, due to the fact that the Intermediate

(*Please turn to page* 43)

Sectional views of the new Air-Steering Unit developed by Bendix-Westinghouse engineers and now offered to fleet operators for use on existing equipment.



SILVER EDGE

Raybestos FW

HEAVY DUTY
Dispels Heat . . . .

RAYBESTOS FW Heavy Duty Brake Lining is a brute for punishment — most powerful and efficient lining of its type ever developed. This lining easily withstands the shocks, strains and excessive wear of heavy duty service and for that reason assures the utmost economy. Raybestos FW adds a factor of safety which is beyond price. Fleet owners everywhere use and endorse this brake lining.

DESIGNED on the "heat bridge" principle. Strands of large guage plastic metal run through the lining from one side to the other. Strands are in direct contact with drum and lining surface at the same time. Heat radiates into shoe and adjacent parts. Herculean strength is an outstanding feature. FW is flexible and delivered in rolls.

The big swing is to specially compressed woven linings for the toughest service with easiest pedal pressure—Raybestos FW is the answer.

THE RAYBESTOS DIVISION
of Raybestos-Manhattan, Inc., Bridgeport, Connecticut

Say "I saw it in FLEET OWNER"—It Helps!

TROUBLE SHOOTER

(You Ask 'Em — We Answer 'Em)

A department, devoted to correspondence from readers of FLEET OWNER. Any questions having to do with automotive service will be answered in this department. All properly signed inquiries will be replied to by mail and such of them as are believed to be of possible interest to other readers will be published in these columns.

A Treatise on Governors

Question: Will you kindly define the various types of governors, namely, fly-ball type, velocity type, etc. Is it possible to get a book or literature on the function and action of different types of governors?—J. W. D., Lewiston, Pa.

Answer: The "fly-ball" type of governor is probably the mechanical type, called by that name because of the fly-weights or balls that, by centrifugal force, actuate the governor. This type must be driven by the engine, by a mechanical connection, such as through gears, and the faster the engine runs, the farther away from the center the fly-weights will travel. This travel is connected with levers, etc., so that the carburetor throttle is partially closed when a pre-determined speed is reached. The best illustration of the fly-ball principle may be found in the automatic spark advance that is found on most motors.

The "velocity" type of governor is installed between the carburetor and intake manifold. Its operating principle is based on the use of an offset throttle plate, usually of rectangular shape, which is acted upon by pressure of the gases that travel through the intake manifold. This pressure moves the throttle plate, which in turn controls the volume of intake mixture. There are, of course, various springs hooked up in connection with the throttle plate, by means of which adjustment of the governor is made, the springs serving, also, to balance the operating torque developed by the throttle plate.

There are other types of governors, including the vacuum type, which operates off the intake vacuum; also the electro-vac, which is a combination of electrical and vacuum principles. The "velocity" type is perhaps the easiest to install, since no mechanical connection with moving engine parts is required; it is just slipped in between the carburetor and manifold and bolted up.

As requested, we are sending you a set of literature issued by several governor manufacturers, inasmuch as we know of no book on the subject that is up-to-date. Should other readers desire this set of literature on governors, the Editor will be glad to see that it is sent without obligation. Just drop a line to the Editor and ask for "Free literature on governors." It is not necessary to send postage.

You May Not Believe It!

(But It's True)

THE FACT:

THERE is no such thing as "S.A.E. Horse-Power Rating." If you heard of it, or saw it in print, it's wrong.

EXPLANATION:

THE common method of determining H. P. ratings for license purposes, etc., often referred to as "S.A.E. Horse-Power" should be called "N.A.C.C. Horse-Power." The National Automobile Chamber of Commerce is responsible for this rating and the S.A.E. had nothing to do with it, save for the fact that it used to be published in the S.A.E. Handbook.

Many car, truck and bus manufacturers still use the term "S.A.E. Horse-Power" but this is technically incorrect. Besides, the method of arriving at the horse-power is wrong, as it does not consider the stroke of the engine, or the r.p.m.

The N. A. C. C. rating, "D-Square-N Over 2.5" means "diameter of cylinder, multiplied by itself, multiplied by the number of cylinders and divided by 2.5." Next time anyone talks "S.A.E. Horse-Power" to you, tell them that the S.A.E. never had a horse-power rating for automotive engines. You'll be right, brother, you'll be right!

Carburetor Adjustment on Packard Eight

Question: I am having trouble adjusting the carburetor on a Packard Eight, Model 6-26. Can you tell me the correct distance between high and low speed adjusting nuts on spring, adjusting shaft or any other information on this carburetor?—F. A., Ponca City, Okla.

Answer: The adjustment is as follows: Idling adjustment is obtained by turning the idling screw to the right to make a rich mixture and to the left for a lean mixture.

The clearance between the two choke levers should be at least 1/16-inch. The high speed adjustment is on the bottom of the carburetor. Average high speed adjustment is eight notches from a closed position. Highest mileage is obtained when this is kept as lean as possible. Turn the notched nut to the right for a lean setting; and to the left for a richer mixture.

Connect Condensers in Parallel

Question: I have read in the Trouble Shooters' Department in January, that two condensers should sometimes be used, where a single condenser does not have sufficient capacity on a 12-volt system. How should these be connected? In series or in parallel?—S. A., P. L. Co., Chicago, Ill.

Answer: The only practical way to install two condensers is to hook them in parallel. This doubles the effective capacity. Such a practice should not be encouraged, generally, as this might cut down the top speed as well as cause point-pitting from over-capacity.

If we did not make ourselves clear in our January issue, the capacity of a condenser for 6 or 12-volts is generally the same, the only difference being that the 12-volt condenser should have additional insulation. The ideal condenser capacity for general use is approximately .20 to .25 microfarad.

VALUABLE NEW SAFETY BOOK

free!

100,000
Truck and Bus fleet operators will want this important handbook

Forty-eight pages, graphically illustrated—chock full of the latest information on safety practices—valuable safety data that you can put to immediate use.

Tells you how to reduce traffic accidents . . . cut maintenance costs . . . win safety awards . . . save money . . . build good-will for your firm . . . . . .

Goodrich Safety Silvertowns for fast service. The "safest truck tire ever built" has established phenomenal mileage records—gives you more road contact area — more anti-skid lineal edges—greater resistance to skidding than other leading tires.

HERE'S your book-of-the-hour. A book that shows you graphically, step by step, how you can prevent accidents to your fleet—materially cut operating costs—organize a safety award contest—how to win gold and silver awards—establish a safety council—a bonus system. And a dozen other ways to save money—build good-will for your fleet through simple, easily-adapted safety practices.

All the information contained in "The Silvertown Safety Manual for Truck and Bus Operators" is *tested . . . practical.* Insurance companies, truck and bus fleets, safety experts, all contributed generously to make this remarkable book possible. And the net of our findings—the outstandingly successful methods—have been boiled down into forty-eight interesting, fully illustrated pages.

CONTENTS

Part I
Organizing the Silvertown Safety Drive
Part II
Suggested safety talks and procedure
The Safety Pledge
Six common causes of accidents
Part III
Where accidents occur
The maintenance of vehicles
Care of tires
The pedestrian
Establishing bonus plan
Organizing a safety board

Here at last is an authoritative handbook of safety practices for operators of commercial vehicles that is complete in every detail. And it's free!

Send Today

But, remember the number of copies is limited—so don't delay. If you operate a fleet of five or more trucks or buses, we urge you to act at once. Send today for your free copy of "The Silvertown Safety Manual for Truck and Bus Operators". Simply mail the coupon now.

Goodrich

Safety Silvertowns

for Trucks and Buses

MAIL THIS COUPON

The B. F. Goodrich Rubber Company,
Dept. T-37, Akron, O.
Gentlemen: Please send me your booklet, "The Silvertown Safety Manual for Truck and Bus Operators".

Name.....

Company.....

City.....*State*.....

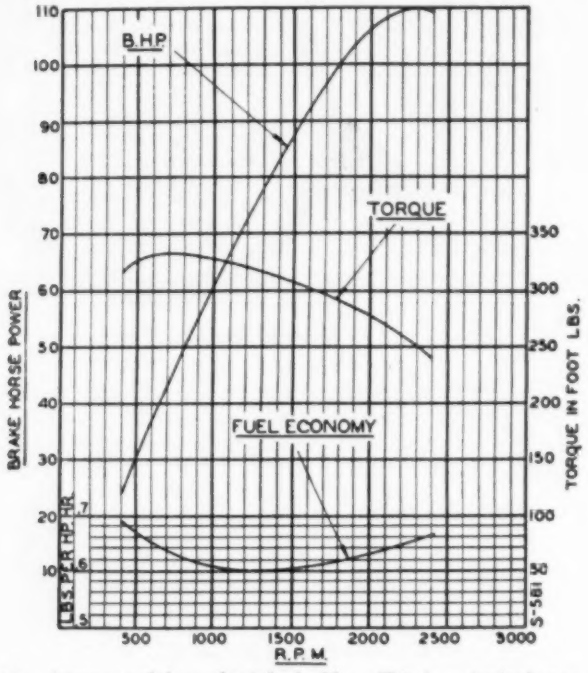
Say "I saw it in FLEET OWNER"—It Helps!

TROUBLE SHOOTERS' DEPARTMENT (*Continued*)

Torque and H.P. Curves Explained

Question: Can you tell us, through the medium of your publication, the meaning of the torque curve, how it is obtained on the motor charts and what relation it has to the horse-power, in selecting a motor for a motor truck. We have seen these charts but do not quite understand them.—J. S., A. B. Co., Chicago, Ill.

Answer: Torque is simply turning force and the torque curves that appear on the engine charts are simply dynamometer test readings at the various r.p.m. transcribed into chart form, just as the h.p. readings are transcribed. When the engine is put through its tests, this torque, or turning force is measured by the dynamometer and recorded on the charts. There is no other way (to our knowledge) of testing for torque, except with the dynamometer. Torque is usually given in "pounds-foot."



What a torque and h.p. chart looks like. This is a typical one, belonging to a Waukesha Ricardo-Head Six cylinder engine.

As to just what torque represents, let us take a one-cylinder engine with a 4-inch stroke. The radius of the circle described by the crank-pin would be 2 inches. Transcribed into feet this would be 1/6th of a foot. Again for example, let us assume that the force on the piston amounts to 12 pounds. Multiplying 12 pounds by 1/6th foot, would give us 2 pounds-foot of torque per cylinder. That is torque, or $T = R \times F$.

With reference to the relation between the torque and h.p. curves on the motor charts. It is noted on most charts that although the h.p. curve continues upward, the torque curve drops off when a certain r.p.m. is reached. This is because of the fact that at higher speeds the charge of explosive mixture is somewhat lessened, and consequently the force acting on the piston is less, in spite of the increased r.p.m.

Torque has nothing to do with speed, actually, because even if the crank is not turned (as in a stiff motor) considerable turning effort (or torque) could be exerted without moving the crankshaft. We presume that you are acquainted with the meaning of horse-power. One h.p. is the ability to do 33,000 foot-pounds of work per minute. The reason why the h.p. curve does not continue to go up indefinitely with increased r.p.m. is because the dropping of the torque curve keeps down the "ability to do the work."

The direct relation between torque and h.p. can easily be seen from the following formula:

$$\frac{6.2832 \times T \times \text{R.P.M.}}{33{,}000} = \text{Horse Power}$$

Explaining this, the first figure (6.2832) is used because, as before stated, torque equals the radius of the crankpin travel multiplied by the force on the piston. The distance around this circle would be 3.1416 times the diameter, and the diameter is always twice the radius. Therefore, as the "work done" equals the force times the circumference, we would get the circumference by multiplying the radius by 6.2832. And since the torque equals the radius times the force, the "work done" equals 6.2832 times the torque, times the r.p.m. Since one h.p. equals 33,000 foot-lbs. per minute, the "work done" is transposed into h.p. by dividing by 33,000.

●

Which Wheel Does the Slipping?

Question: In a railroad car with solid axles, when rounding a curve, which wheel does the slipping, since no differential is used? "A" says that the inside wheel slips and "B" says it's the outside one. Please settle this question for us.—H. E. D., New York, N. Y.

Answer: This is a bit out of our line, but we will venture our guess, figuring that it is as good as the next fellow's.

We believe that the outside wheel does the slipping—that is, it slides forward on the track while the inside wheel contacts the rail without slipping. The reasons for our agreeing with "B" are that the railroad bed is usually banked on the turns, with the slope towards the inside. This banking, in our opinion, would cause a temporary shifting of more weight to the inner wheel, giving it better traction and allowing the outside wheel to slip.

If there are any ex-railroad men in the fleet-brotherhood that follows this publication, we would be glad to have you tell us if we are wrong.—(*Editor*).

●

Why AC and Not DC Current?

THE invention many years ago of the electric transformer, a relatively simple and cheap static device by which alternating-current voltage can be raised or lowered, was one of the major reasons why alternating rather than direct current was adopted by utilities.

A device corresponding to the transformer was not available for use with direct current, which was used in the beginning of the industry, so as demands increased for added power, higher voltages and greater distances of transmission, alternating current became more and more standard.

Direct current is not without its advantages, however, especially in respect to stability, reactance, dielectric loss, insulation values, capacity, and amount of copper required for transmission and distribution. All these advantages were necessarily lost, since only alternating current was considered practical.—*C. W. Stone, General Electric Company, Schenectady, N. Y.*

THE SKF GALLERY OF DISTINGUISHED PERFORMANCE USERS:

STANDARD MOTOR TRUCK COMPANY

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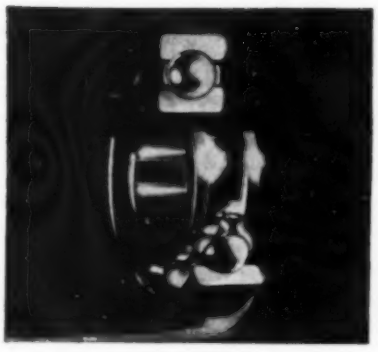
HEAVY loads...long and short hauls... make little difference to SKF Ball Bearings on motor trucks . . . they always give dependable, low cost service. No matter what the bearing location, SKF's insure smoother, quieter operation, with comparatively little attention. Such reliability and economy make SKF Performance Take Preference Over Price on Fisher-Standard Motor Trucks.

SKF Ball Bearings are on the clutch pilot of all models...and are also selected when unit power plant transmissions are used. SKF precision continues throughout a long life marked by freedom from wear and *no bearing adjustments.* Where close check is kept on results SKF's deliver the greatest mileage at the lowest cost per bearing dollar.



SKF INDUSTRIES, Inc.
40 East 34th Street, New York, N.Y.

3001

WHERE PERFORMANCE TAKES PREFERENCE OVER PRICE

● *You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little*

SKF
BALL AND ROLLER BEARINGS

Say "I saw it in FLEET OWNER"—It Helps!

3. The Inside Story of Ethyl Gasoline. A well gotten up booklet that answers any question you might have in mind about Ethyl Gasoline. It's written in plain English, with all the high-hat, engineering terms left out, and, believe us, it's mighty interesting.

•

24. Something for Nothing is usually worth what it costs, but don't think that there isn't an exception to this rule once in a while, anyway. Here's a good brother that offers you a liberal-sized sample tube of gasket cement. If you like it, use it up and buy the next lot from your jobber. The sample's free and we're here to see that you get it. Ask for No. 24.

•

26. Getting More Work Out of Motor Trucks. Not by psychological sales talks to your drivers, not by soft-soaping or slave-driving them, but by intelligently keeping a system of recordings of the operation of each and every vehicle in the fleet. If your drivers have lunch-time sweethearts, you'll know it, too. Number twenty-six brings the "here's how" without obligation.

•

31. Brake Technology. Don't let the big word scare you. This is a pocket-sized book containing questions and answers on such subjects as asbestos, co-efficient of friction, self-energization, pedal pressures, etc. It also gives formulae for determining stopping distances and other figures and describes the various types of braking systems now in use. Troubles, Causes and Remedies are also given. Written in language that even your Editor can understand.

•

59. Facts About Air Brakes. It seems we've forgotten to include anything on air brakes in our previous announcements of literature, but "better late than never." A 28-page book is available that gives all the information necessary on the subject of Air Brakes. It tells what they are and how they work; also gives interesting cost figures on brake maintenance per mile. We should not want to be accused of partiality, so number 59 brings the air brake literature.

WHAT DO YOU READ?

HERE'S a hand-picked assortment of literature that is offered to you entirely without obligation.

We've even made it easy for you to get it. Fill in the coupon below, mail to the Editor, and let us do the work. We'll ask them to send it at once and not to bother you with salesmen, either.

52. Not Woven, Stitched or Laminated. A new type of brake lining that is supplied in rolls, sets or units. As the maker would say, it's a "dense, non-metallic, homogeneous, solid brake material that contains no rubber." If the suspense is too great, just mark No. 52 on the coupon below and we'll see that you get the literature on this new braking material without obligation.

•

78. Don't Add Up These Savings. If you do, you'll find that they total 150 per cent and we'll be owing you money. However, one of our governor makers tells us that his product will save you 25 per cent on gasoline, 40 per cent on oil, 40 per cent on repair bills and 45 per cent on tires. We'll dare him to prove it to you, if you say so. Number 78 will bring the facts.

•

100. Safety Manual for Bus and Truck Operators. This is an especially prepared 48-page manual, full of the latest information on safety practices that you can put to immediate use. It is graphically illustrated and will be sent free. Number 100, please.

•

101. Eleven Definite Savings. This is the title of a booklet that reveals how other fleet operators are reducing operating costs as much as 50 per cent. "You'll wish you had read it years ago!" is what the firm issuing it remarks. If you can't think of eleven things that can be chiseled further, write for No. 101. It's free, of course.

•

102. Having Battery Troubles? Never again will your batteries become overcharged, or undercharged either, for that matter. Here is some new literature from a firm that's not trying to sell batteries. What they have is a new type of generator that is claimed to be as efficient a "watchman" as is the thermostatic control on your oil burner at home. Even if you are a human coal-shoveler and ash-remover, you can appreciate the advantages of this new generator. No. 102 brings the dope without any strings attached.

•

103. One for All and All for One! This is not a new Roosevelt slogan, although it is quite apropos. It's the title of a new booklet that describes a new type of brake lining. This is a flexible molded job that is claimed to be equally suitable for all types of brakes, whether internal or external, for all cars, buses and trucks. This all-purpose lining is said to be "road-conditioned" at the factory. The booklet, listed, as No. 103, is free for the asking.

•

104. Handsome Is as Handsome Does. Literature has been prepared describing the new Dodge Commercial Cars. Besides being good looking, they are said to be low in first cost and economical to operate. Number 104 brings descriptive booklets without obligation.

•

105. No More Timing Gear Rattle. If your trouble shooters have been bothered with an elusive knock on four-cylinder Fords, sounding like a cross between a wrist-pin tap and a piston slap, have you ever thought of the timing gear? If the bolt holes in the cam gear become elongated, there's nothing like a new gear with a metal center to prevent repetition of the knock. Number 105 brings literature describing this gear—and it comes in standard and three oversizes as well.

•

106. Now Is the Time. You'll undoubtedly be draining out anti-freeze, some of these days and this operation should include a check-up of all water-pump parts. In order that you'll be prepared for an unexpected emergency, it's a good idea to have a catalog of water-pump replacement parts. Number 106 brings a copy free, covering many models of cars, trucks and buses. Need we say more?

•

107. Big Brooklyn Bakers Bake Bread. They also use metal-faced plywood on their truck bodies—even on the small electrics. This material allows light weight and rigid, compact construction, which means greater load capacity per vehicle. If you are interested in the facts about this material—choose your own make—No. 107 on the coupon will bring literature on the subject without obligation.

The Editor, ...1933
FLEET OWNER,
90 West St., New York, N. Y.

Kindly send me without obligation, the following free books mentioned in the.....issue. (Literature will not be sent unless firm name is given.) Order by number.

....

....

....

Firm Name .....

Address .....

City and State .....

Your Name .....Position .....

THERE are so many makes and brands of replacement parts available to fleet owners—and so many questionable sales inducements—that it is hard for maintenance men to always select the best.

ONLY RESULTS CAN COUNT—that is why Sealed Power piston rings, pistons, pins and cylinder sleeves are manufactured and serviced by Sealed Power's own engineers to meet every individual requirement of fleet customers *before* and *after* sales are made . . . . Sealed Power can and will give you better and more economical performance—simply ask for a proof of this statement by filling out the coupon on this page.

● Mail This Coupon Today!

Sealed Power Corporation,
Muskegon, Michigan.
O I am interested in giving Sealed Power a trial—Your representative may call.
O I am interested in the use of Sealed Power Cylinder Sleeves—I want all information.
O Send me your Sealed Power Chart showing correct piston clearance information, as well as replacement piston ring combinations.
My fleet consists of
Name
Address
City State

SEALED POWER CORPORATION
Formerly The Piston Ring Company
MUSKEGON, MICHIGAN

"SEALED POWER"

RESTORES NEW PRODUCTS CAR PERFORMANCE

Say "I saw it in FLEET OWNER"—It Helps!

QUESTION *of the* MONTH

"By far, one of the most valuable departments to be found in any automotive publication. Every fleet man should be delighted to cooperate."—A Reader

Here are Some of the Most Interesting Replies to Question No. 29:

"Clean Vehicle is Best Advertisement"

"OUR vehicles are washed weekly, and more often when necessary. This is done in our own shop, using regular city water pressure. We do not use soap.

"The passenger cars are polished every two weeks, also in our own shop, by hand, and we use polish of the Simonize type, obtained from a local jobber.

"We believe a clean vehicle is the best advertisement possible. Our fleet has just been all repainted and our drivers are instructed to keep the equipment as clean as possible at all times."—*T. Rauch, Secy., Kohlman Bros. & Sugarman, New Orleans, La., operating a fleet of 7 trucks and 5 passenger cars.*

●

"Frequent Cleanings Impossible"

"AN average of once a month is wash time in our fleet. We use regular water pressure, wash in our own shop and do not use soap. We do not polish the vehicles.

"Our fleet is almost entirely a field fleet, hauling vegetables to packing sheds and we find the cost of frequent cleanings prohibitive, as our men are on a straight time basis. Consequently the vehicles are not cleaned very often."—*G. M. Elberson, Asst. Mgr., Bradley Truck Company, Santa Maria, Calif., operating a fleet of 14 trucks, 6 trailers, 2 passenger cars and one other vehicle.*

●

Again, We Forgive You—

—for your failure to send in the Question-of-the-Month blank last month. The banking holidays, lack of ready cash and the shortage of postage stamps were enough to put a crimp in the morale of even our strongest-minded, public-spirited citizens. Even as You and I.

Now that things are straightened out and business is definitely on the upgrade, won't you cooperate to make this department a success?

Many fleet men have told me that this is the most valuable and interesting department in the book. You can help to keep it so, by filling in the blank on the opposite page and mailing it in to me. We won't give out the information. To make sure, write the word "CONFIDENTIAL" across the face of it.

In return for your efforts I will send you a type-written tabulation of all the returns that come in, so that you can see what other operators are doing along these lines. Thanks, a lot.

H. Clay Fischer, Editor

Milk Fleet is Washed Every Day

"EVERY day is wash day for the vehicles in our fleet. Washing is done in our own shop. Very little soap is used and a high-pressure washing machine is used for the under-gear only.

"Polishing is also done every day, both by hand and electric. We use a liquid polish to clean, and a wax to shine. This material is all purchased from a local dealer, in cans and in bulk. Once each month the vehicles get a protective coating of super-wax.

"By washing and polishing as stated above, we have been able to cut down the cost of frequent repaintings, and at the same time we have good looking equipment on the streets."—*H. Weiner, Supt. Motor Transportation, Whiting Milk Company, Charlestown, Mass., operating a fleet of 340 trucks and passenger cars.*

●

How a Laundry Keeps 'Em Clean

"THE vehicles in our fleet get a complete wash every two weeks, but in dirty weather we use the hose for extra work, as required. This washing is done in our own shop, using a combination of hot and cold water; also steam and air, used singly or in combination, as required. Soap is used.

"We do not regularly polish the vehicles, as we use the new type enamel and find that it is cheaper to paint than to do a good job of polish, particularly since we have our own spraying apparatus.

"For body polish, we would prefer the liquid type wax, which we purchase in one-gallon cans."—*E. B. Francis, Pres., Empire Laundries, Inc., Hartford, Conn., operating a fleet of 11 trucks and 1 passenger car.*

●

Trucking Fleet Is Washed Often

"WASHING of our trucks depends on weather conditions. Once, twice or three times a week is not unusual for washing, which is done in our own shop, using DeVilbiss machine, compressed air, soap and brushes.

"We only use polish in some cases, on new equipment. We prefer the liquid type and buy it in 1-gallon cans from a jobber. Since our equipment is painted often, we do not use much polish.

"Our drivers are furnished with rags and get instructions to use them and wipe off all equipment each day if possible."—*Ben F. Weber, Supt., Columbia Terminals Co., St. Louis, Mo., operating a fleet of 152 trucks, 109 tractors, 445 trailers and 19 passenger cars.*

A FEW *of the* WASH-POLISH REPORTS *(Continued)*

Goes to Duty "Like Good Soldiers"

"THE vehicles in our fleet are washed after each trip, in our own shop, using a Bean power spray pump. We use soap when needed.

"When a job requires polish, this is done, also in our own shop, using an electric polisher. We prefer a liquid polish, which is purchased in gallon cans from our jobber. About one gallon per month will take care of our requirements.

"When new passenger cars are placed into service for the first time, they are given a special polishing of the 'Simonize' type, using Dupont materials.

"We maintain a large company service garage and our equipment, like good soldiers, goes to duty each day carefully inspected, serviced and cleaned."—*B. T. Van Camp, Mgr. Motor Trans. Div., Geo. A. Hormel & Co., Austin, Minn., operating a fleet of 257 trucks, 16 trailers and 215 passenger cars.*

●

Soap Shortens Life of Paint?

"ONCE a week, at least, our vehicles are washed. This is done in our own shop, with a high pressure water pump that gives from 100 to 400 lbs. We do not use soap.

"The vehicles are polished at least twice a year. This work is done by hand, in our own shop, using liquid polish that is purchased in gallon cans from our jobber. We use about 1 gallon per month. We do not do any 'special' polishing, such as 'Simonize.'

"We have found that soap shortens the life of the paint. Clear water cleans the trucks just as well, we believe, and with no extra time. First the trucks are squirted off; then they are rubbed down with a camel's hair fountain brush."—*John Zerbo, Cost Acct., Streitman Biscuit Co., Cincinnati, Ohio, operating a fleet of 28 trucks.*

●

Power Washer Cuts Soap Costs

"BEFORE installing a power washer we were using about 600 lbs. of soap per year, but with the help of a little coal-oil, now and then, we are doing the same job without soap.

"Our vehicles are washed every week; oftener if necessary. We do this in our own garage, using a Hardie power washer with a little coal-oil to cut the grease.

"The passenger cars are polished twice a year, by hand, in our own shop. We use both liquid and wax polish, purchased in cans from our jobber. We do not do any special waxing to new vehicles, but this is done every six months, as a general rule, after they have been in use."—*R. B. Mason, Supt. Maintenance, Kansas City Gas Co., Kansas City, Mo., operating a fleet of 65 trucks, 3 trailers, 25 pass. cars and 4 miscellaneous vehicles.*

(Please tear out and mail to The Editor, The Fleet Owner, 90 West St., New York City)

Question No. 31—Chassis Lubrication

How often are your vehicles greased?.....

Is this work done in your own shop?..... Farmed out to other shops?.....

What is the total cost (approximate) per greasing?.....

What type of lubricant do you use? Fibrous ☐ Semi-Fluid ☐ Cup Grease ☐

Please state the make, if permissible.....

About how many pounds of lubricant do you use per month?.....

What is your source of supply? Oil Company ☐ Jobber ☐ Service Station ☐

What type greasing equipment is used? Hand ☐ Pneumatic ☐ Electric ☐

Please state the make, if permissible.....

What is your source of equipment supply? Oil Company ☐ Manufacturer ☐ Jobber ☐

Do you use one type of grease for all fittings?.....

If not, how many different types of grease do you use?.....

Do you use special grease for water pumps?..... For universal joints?.....

Any other remarks that you think fleet operators would find of interest?.....

.....

.....

.....

.....

How many vehicles in your fleet?

.....Trucks; .....Busses; .....Trailers; .....Pass. Cars; .....Others.

***Note:** If you cooperate with us and fill out this questionnaire, you will be entitled to a tabulated report covering all of the answers.*

Swap your Maintenance experience with other fleet operators in this easy, convenient way. We do the work. You get the benefit.

Name of Firm .....

Address .....

City and State .....

Your name .....*Position*.....

SERVIDOR-EQUIPPED

Every room in Hotel Fort Shelby is servidor equipped. This eliminates excessive tipping and insures the guest's privacy. Hotel Fort Shelby was the pioneer in installing this notable convenience eliminating any need of annoying intrusions. ¶ No other hotel in Metropolitan Detroit is so near the principal railway terminals, airports and steamship piers. Hotel Fort Shelby's location in the heart of the motor city's shopping, theatre, financial, insurance and wholesale districts is a happy one. ¶ You'll be delighted, too, with the efficient . . . unpretentious service offered by this truly fine hostelry. 900 rooms . . . all with private bath and circulating ice water. Rooms as low as $3.00 per day . . . suites $10.00 and upwards.

Motorists are relieved of their automobiles at the door without service charge. Write for free road map, and your copy of "Aglow with Friendliness," our unique and fascinating magazine.

HOTEL Fort Shelby

"AGLOW WITH FRIENDLINESS"

E. J. BRADWELL, Manager

DETROIT

Reducing Fleet Maintenance Costs

(*Continued from page* 10)

ing platforms each night, ready to start out the next morning. At the entrance to the warehouse, under cover of course, is the gas and oil dispensary, so that trucks can be serviced on entering or leaving the building.

The trucks are washed, oiled and greased right where they stand, in the warehouse, overnight. There is an air line and a water line for each two trucks and every truck in daily use is washed each night and the tires are tested for the proper amount of inflation. On one side of the warehouse, first floor, is the package loading platform where these trucks are garaged and on the other side is the furniture loading platform where the furniture trucks are garaged and serviced.

A Ford roadster is used by our mechanic for road work and to make minor adjustments, on the streets, on trucks that have ceased to function for some reason or other. Every effort is made to either fix the truck right there so that it can go on its way or it is towed in. Even minor axle repairs have been made on the road from time to time. In fact, only on rare occasions has it been necessary to tow a truck into the garage.

We used to employ a washer, but now we use two old reliable drivers and split the washer's salary between them, and they test, grease and wash cars and do it in 3½ hours with our modern equipment and do it better than a washer, which is more satisfactory all around because of labor turnover, etc. We are also equipped in our garage to do all of our own painting, which is another worthwhile economy.

Savings on tire mileage and gasoline consumption are effected through proper instructions to drivers. The gasoline consumption of each truck is watched and the driver is contacted with personally by the writer if his costs seem over the average or excessive in any way.

I personally meet each driver and helper every Monday morning and take up things that have passed during the week; any mistakes that have been made; any discourteous action toward the customer; or complaints of any description. At this meeting we also take up safety measures and cases of improper driving, and the men are instructed how to drive, how to apply their brakes, etc. We have found this procedure to be more effective than any manual we have been able to get out, and in that way we have been able to interest the men personally in their work, and to make them take more interest in performing their daily tasks properly.

We use a helper and promote him to a driver in an emergency. We hammer on courtesy all the time. When he rings the customer's door bell, the first thing he must says is "Good Morning" or "Good Afternoon," and we instruct him to say to the customer: "Does Mrs. Jones live here?" and if the customer says "Yes," he replies "I have a package for you," and when she receives it he always says "I Thank You."

Determining Future Policies

(*Continued from page* 12)

plies properly dispensed and protected? Is the stockroom accessible to all garage and mechanical employees? Are platinum points, spark plugs, etc., carefully protected by keeping them in locked containers?

We keep a record of road calls. We analyze gasoline and oil, water from radiators, water for flushing batteries, the sale of junk material, etc.

I realize that little has been said in these articles about actual maintenance procedure, it being my intention only to outline a system or method which, if worked out, will produce economical maintenance results.

READER SAY-SO

(Picked at Random from The Editor's Mail-Bag)

A Friend, Indeed

DEAR MR. FISCHER: A good friend of ours proved himself as such recently, by handing us some copies of FLEET OWNER. The type of material presented is of the best and most interesting and we should like very much to be placed on your mailing list.—*Geo. A. MacDonald, Asst. Secretary, Regulated Motor Carriers, Inc., Indianapolis, Ind.*

●

"A Lot of Good"

TO the Editor: "We have been receiving your magazine FLEET OWNER for several years and really get a lot of good out of it. We wish to get some information on replacement parts for Fords and Chevrolets, as we intend to enlarge our parts stock—etc."—*J. J. Gatchell, Victory Cab Service, Kansas City, Kansas, operating a fleet of 2 trucks, 4 taxicabs, and 28 "Driv-Yourself" cars.*

●

"Third Party" OK's It

"WE operate a fleet of 14 trucks and 12 passenger cars. Our garage superintendent informs me that he reads FLEET OWNER thoroughly and secures some valuable information from it at times. We thank you for this service."—*Tompkins Bros., Newark, N. J.*

●

"Very Valuable Reading"

DEAR EDITOR: "We are subscribers to your magazine, THE FLEET OWNER, which we find very valuable reading. We are considering starting a truck line between our city and Baltimore, to haul lumber in, and to carry freight as a return load. Any information as to equipment, etc., that you can give us will be appreciated."—*Citizens Lumber Co., L. T. Yates, Parkersburg, W. Va.*

A Note of Appreciation

"WE wish to thank you for the pleasure and up-to-the-minute information your publication FLEET OWNER has brought ourselves and various members of our department during the past year.

"Your magazine has helped us greatly in our maintenance work, and we trust that we may be so favored during the year we are just entering. We are enclosing a corrected list of our fleet supervisors and would consider it a great favor for them to receive FLEET OWNER during the year of 1933."—*Howard A. Evans, Asst. Supt. Motor Transportation, Phillips Petroleum Company, Bartlesville, Okla., operating a fleet of 609 trucks, 683 passenger cars, 88 tractors and 146 trailers.*

●

Stamp of Approval

"I AM returning your blank herewith. My name and address as it appears on your list is o. k. FLEET OWNER is also o. k."—*J. Harrington, Garage Foreman, R. H. Macy Company Garage, Yonkers, N. Y.*

●

Appreciates Us Very Much

"DEAR EDITOR: I have been receiving your magazine FLEET OWNER for some time past and needless to say, I appreciate it very much. We operate a fleet consisting of 20 trucks and 5 passenger cars and have our own repair shop for servicing this rolling equipment. Thanks for sending your publication."—*C. L. Todd, Superintendent of Maintenance, Sanitary Baking Company, Clarksburg, W. Va.*

"Enjoy It Every Month"

"WOULD be glad to receive the literature as per enclosed coupon. You have a very nice, well-edited magazine in FLEET OWNER. I enjoy reading it every month."—*A. R. Long, Jr., Asst. Garage Foreman, State Road Commission of W. Va., Charleston W. Va.*

●

Likes Trouble Shooter

"DEAR Mr. Fischer:—Each month we read with a great deal of interest the various articles in FLEET OWNER and are especially interested in your Trouble Shooters' Department. We are very much interested in the problems covered by this book."—*J. A. Roper, Service Manager, Dayton Rubber Mfg. Co., Dayton, Ohio.*

●

We Are Missed Once

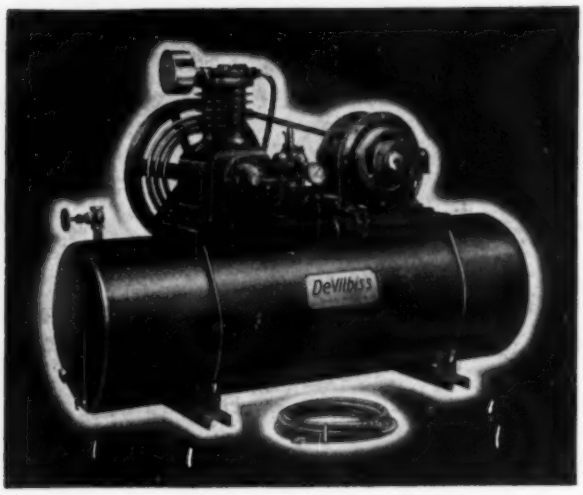
DEAR EDITOR: "We have today received our January copy of FLEET OWNER but for some unknown reason we have not received the December issue as yet. We will be very grateful if you will forward a copy of same, as we find this magazine to be exceedingly interesting and helpful."—*Joseph J. Regan, New York & Clifton Transportation Co., Carlton Hill, N. J.*

●

It's Got to Be Good

DEAR MR. FISCHER: "We are developing a truck spark plug for fleet owners exclusively and undoubtedly shall want advertising space in your FLEET OWNER, which we believe is the best publication of its kind in the field today. When this plug is ready we shall be glad to send you a sample test set."—*Whiteman Products Corporation, Indianapolis, Ind.*

AIR COMPRESSORS, SPRAY FINISHING AND OTHER AIR-USING EQUIPMENT



● **DeVilbiss Oil Guns, with their simple adjustments, hit the hard-to-reach places with lubricating or penetrating oil quickly and easily. Strongly made, easy to operate, nothing to get out of order. Used with or without compressed air; with feed cup or hose from large container. Before you buy any air-using equipment, see the DeVilbiss Line, including the highly efficient Air Compressors for fleet service garages. At your nearest DeVilbiss jobber. Or write for catalog.**

THE DEVILBISS COMPANY · TOLEDO · OHIO

New York Philadelphia Cleveland Detroit Chicago
St. Louis San Francisco Windsor, Ontario

Distributors or direct sales and service representatives available everywhere

PRO-TEK protects the skin against gasoline, battery acid, fumes. Paint, lacquer, oil, grease and dirt wash off with running water. Send for free sample.

HOSE

DeVilbiss

Defining "Adequate" Brakes

(*Continued from page* 18)

of you who are inclined to disagree might take a moment out and imagine this situation: A truck is going down the street equipped with a poor service brake. The driver steps on the pedal and it goes to the floor-board when 60 feet from the crosswalk. The lights in front of him have turned to red and he is doing about 20 miles per hour. What chance has the other car with right-of-way, when that truck is still rolling and the emergency brake is not in condition to stop it? Well, the answer is, the truck sailed through two cars and two people were killed. This was an actual happening and a case where the driver did not think he needed an emergency brake on his truck because he never before had to use it for anything but a parking brake. If he had used it, and it was in good working order, two lives would have been saved.

In conclusion, our relation with the fleet operator can be just as much a helpful one as it is an objectionable one. For instance, if an accident happens and someone is killed, but the fault is not on the part of the fleet operator, as revealed by the tests of the Homicide Squad—that is, the vehicle is in perfect operating condition as regards brakes, horns, etc., our findings would be more helpful than damaging to the operator. On the other hand, if our tests reveal that the vehicle had faulty brakes, well then the operator is just out of luck. We are fair to everyone.

●

Lubricating Outdoor Equipment

(*Continued from page* 24)

from gritty dust and dirt is necessary.

For equipment exposed to outdoor conditions, lubricating greases containing pure electric furnace graphite have been found to be particularly suitable. Whether applied to the lubrication of cables, chains, gears or revolving bearings, the graphite improves the contacting surfaces with use. It gradually works into these surfaces equalizing microscopic irregularities. Its high affinity for grease and oil preserves a film of fluid lubricant under the most severe operating conditions or over prolonged periods of shut down. Each particular part requires special consideration as to the grade of lubricant to be used. This is a matter which is essential to the long life and permanent utility of the part.

●

Valve Inserts Cut Maintenance Costs

VALVE grinding, one of the most expensive and inconvenient items involved in the maintenance of a motor vehicle, has been greatly reduced in many 1933 lines by the use of exhaust valve inserts.

These inserts are made of a high Tungsten steel alloy of such extraordinary heat-resisting quality that the vehicles will run upwards of 30,000 miles without valve grinding, it is claimed.

In actual tests on heavy duty trucks, engines equipped with these valve inserts traveled 50,000 miles in service before it was necessary to grind the valves. Although one manufacturer fixes 30,000 miles as a conservative limit, it is believed that in actual experience it will rarely be necessary to grind the valves during this period.

This means not only a saving in money involved in the actual grinding but also the saving in time and money that accrues through having the car constantly in service instead of in the repair shop.

How to Check Front Axle Caster

(*Continued from page* 28)

of special tapered axle shims.

Steering trouble is a menace to safety. There is a great deal of satisfaction in driving a car, truck or bus that steers easily and does not require a tiring grip or constant manipulation of the steering wheel. Proper front axle caster makes this possible and insures increased driving safety. Give your drivers easy steering. It is a profitable investment. Let them make use of caster, the *driver* that is furnished with their vehicles.

●

Air Steering—How It Works

(*Continued from page* 30)

Lever is hinged on the Pitman Arm at "7". The movement of the upper part of the Intermediate Lever "5" will cause a movement of the Valve Rod and thru the Rocker Arm "3" exerts pressure on the Plunger of Control Valve "9" which is connected to the left side of the Double-Acting Piston "14". Thus air pressure will be admitted to the Cylinder until the cylinder force is equivalent to the resistance of the wheels to turn and move the Pitman Arm "6" to the right. As long as the steering wheel is turned, the valve will remain open. When the movement of the steering wheel is stopped, the movement of the Piston "14" will continue until it moves the upper end of the Intermediate Lever "5" to a position that will allow the Intake Valve "15" to close and cut off additional flow of air. To maintain a certain air pressure in the Air Cylinder, it is necessary to maintain a certain force on the Plunger of the Control Valve Piston. For left hand turn the right hand Control Valve "10" will be actuated and air will be admitted to the right hand side of Piston "14" thereby moving the Pitman Arm to the left.

Air Steering Control reduces road shock and minimizes shimmy, due to the fact that the control valve is reversed through a very slight movement of the drag link. If the movement of the wheel, due to shimmy, is in the direction in which the wheel is turned, the air in the Double-Acting Cylinder will be exhausted and pressure admitted to the opposite side of the Double-Acting Cylinder "C", thereby obstructing further movement of the wheel. If the shimmy movement of the wheel is *against* the turn of the wheel, it will produce additional force on the Pitman Arm which will cause a slight kick-back on the Control Arm and increase the pressure in the Control Valve, which will naturally add resistance against the force of the wheel. For this reason, it is practically impossible to build up a shimmy to an extent that would be noticeable by the driver.

Two years of intensive development on Air Steering culminated in the installation, last June, of the first unit on the Bendix-Westinghouse experimental truck in the laboratories. Preliminary tests proved this original unit so successful that almost immediately, Air Steering began a nation-wide tour. For nine months, with practically no intermittance, this tour has carried Air Steering over a coast-to-coast course, covering an excess of 30,000 miles in actual service. Taking geographic and climatic conditions as they found them, the test crew of the experimental truck intentionally subjected Air Steering to the worst conditions imaginable in any service. Perfect operation in the face of an official temperature of 26° below zero, accompanied by snow drifts which often forced the test truck from the highway into the rough terrain of adjoining fields for continued progress, was only one of the many tests Air Steering met. So conclusively has this test demon-

Truck Costs MUST Be Reduced in 1933

Here's an Easy Way to Do It!

1933 is not a year to fool with . . . your truck costs should be lowered by at least $500 per truck!

Now, here's a proposition. Install *Servis Recorders* on *several of your trucks*. The *Servis Recorder* gives you (on a chart) a complete record of just what your truck did for the past 24 hours—the heavy lines recording running time and the blank spaces in between showing standing time.

That will show up all their delays and idle time. Then eliminate this costly waste of time (averaging $500 per truck).

Keep a record of these *Servis Recorder*-equipped trucks in our Time Record Book (furnished free) and compare their record with the rest of your trucks.

Then you will know what to do about the unequipped trucks, all right. Thousands of truck owners have made this test. That's why over 80,000 trucks are now *Servis Recorder* equipped.

This chart shows up all the delays. Here's a stop of 2 hours!

THE SERVIS RECORDER

"Keeps Trucks Busy"

SPECIAL PLAN

We have worked out an inexpensive "plan for these cost-cutting times" that you'll like. You can *find out* what this little Recorder can do for *your business* with very little outlay. Then you can decide whether to go ahead or not. Send for the Plan today. Just pin coupon below to your letterhead.

THE SERVICE RECORDER CO.
CLEVELAND, OHIO

THE SERVICE RECORDER CO. F.O.-7
Hanna Bldg., Cleveland, Ohio
Send us that *Special Plan*—without obligation, of course.

Company ----------

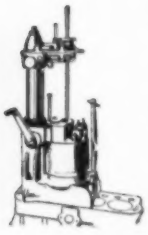
Attention of ----------

Street ----------

City & State ----------

You can set a Van Norman Per-fect-o Boring Bar on a block, center it, clamp it, set the cutter to size and bore a 4" x 10" cylinder, leaving a surface that needs no honing and is ready for piston fitting in 8 minutes.

THAT'S PERFORMANCE!



And the hole will be accurate, round and straight regardless of hard spots, soft spots, welds, open ports or connecting rod throw cut-outs because of an exclusive Van Norman feature.

Four, *patented*, non-revolving, expansible supports located 1/2" back of the cutting tool, travel down the freshly cut cylinder wall right behind the single Carboloy tipped cutter and provide a rigid support and guide during the cutting operation. No other bar does this.

The Van Norman Per-fect-o is still the fastest, most accurate and most easily operated boring bar on the market. Write for details today, no obligation.

The Van Norman Per-fect-o Line

Per-fect-o "Junior" 2.2" (Austin) to 4.005"	$275
Per-fect-o No. 900 2 5/8" to 4 1/2"	295
Per-fect-o No. 905 2 5/8" to 5.120"	375

VAN NORMAN
MACHINE TOOL COMPANY
164 WILBRAHAM ST. SPRINGFIELD, MASS.

P. S. 23 motors now use cam ground pistons. Ask jour jobber to tell you how he cam grinds pistons on his Van Norman Piston Grinder.

IT PAYS TO VAN NORMANIZE

strated the merits of Air Steering that the unit has recently been approved by the Bendix-Westinghouse Company, and is now available for installation upon any vehicle equipped with the conventional, manually-operated steering gear . . . Such is the status of Air Steering today.

Among the many advantages offered by this modern Air Steering device is its ability to reduce steering to a comparatively slight-expenditure of effort on the part of the operator. In addition, due to its powerful action, its use will permit a substantial reduction of gear ratios. Still further, Air Steering provides the operator with a predetermined resistance or "feel" exactly proportionate to the angle of turn. This feel is much the same in principle as that encountered in the conventional, manually-operated steering gear with the exception that the resistance is greatly diminished. This is due to the fact that Air Steering constitutes an unique combination of manual effort and power in its operation. And it is this same feature which insures control at all times, even in the remote event of power failure. Although Air Steering is, as its name implies, dependent upon a pneumatic source for its operation, its normal air consumption constitutes an almost negligible drain on the vehicle's existing pneumatic system. Beyond its obvious features, Air Steering offers many other advantages. Of these, its ability to automatically compensate for a possible shimmying of the wheels is probably the most important and secondly it very substantially reduces the load on the steering gear worm.

As to the future of Air Steering, there is this to be said: Its simplicity of design, ready adaptability to neat compact installation, in conjunction with all existing types of conventional Steering Gears, and its reliability of operation will permit its general use. This will pave the way for future necessary changes in the design of trucks and busses.

For further information and literature on Air Steering, write to Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa. The Editor of this publication will be glad to have literature sent, if you prefer to write to us.

●

Western Operator Pledges Safety Campaign

COOPERATING with the National Safety Council and local southern California agencies, the Keystone Express System, Los Angeles, Calif., through its general manager, J. Nelson Kagarise, recently announced that it is pledged to a greater safety campaign for 1933 than has been in effect at any time during its entire history of 16 years.

Because of their earnest desire to obey all precautionary measures of safety, the company's "courteous truck captains"—a term given to them by one who appreciates their unfailing service toward preserving life and property—are especially careful about children and are always prepared to render first aid to those who may be in need. This is in keeping with the company's policy of public service, which is constantly maintained.

According to Mr. Kagarise, this safety campaign is now in effect and extends throughout the entire Keystone System, which is now operating upwards of 50 motor carriers on local highways. Altogether, this fleet of trucks, which is daily serving more than 160 cities and towns in southern California, travels several thousands of miles each week. It is the aim of the company to keep its record clean and its service the highest.

ARMORPLY

A SUPERIOR METAL FACED PLYWOOD PANEL FOR BODY CONSTRUCTION

Write for samples and prices

UNITED STATES PLYWOOD CO. INC.
603 W. 36th. ST. NEW YORK CITY

KRAMER *Certified cooling* **RADIATORS**

for TRUCKS BUSSES and TRACTORS

OVALTUBE TUBULAR and TURBO CELLULAR CORES

Complete Radiators

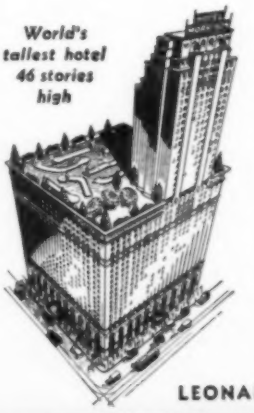
TRENTON AUTO RADIATOR WORKS
Trenton, New Jersey

CHICAGO GOVERNOR
CHICAGO GOVERNORS Save*
25% Gasoline
40% Oil
40% Repairs
45% Tires
Eliminates the cause of 65% of all accidents.
GUARANTEE
We guarantee CHICAGO GOVERNORS to control both engine and traveling speed under all loads, for the life of the engine.
NOTE. Should any CHICAGO GOVERNOR fail to give accurate service at any time, it will be replaced without charge.
CHICAGO GOVERNOR & MANUFACTURING CO.

LIST PRICE
$12.50
Write for discounts

A CENTURY OF PROGRESS and the MORRISON HOTEL

1933 A CENTURY OF PROGRESS CHICAGO



Stay at the Morrison when you visit the Chicago World's Fair of 1933. The Morrison Hotel is an outstanding example of the progress of invention and industry displayed in A Century of Progress. Perfectly located in the "heart of the Loop," everything worth while is nearby —theaters, shops, railroad stations. All rooms are outside with bath, Servidor, bed-head reading lamp and circulating ice-water. Reasonable rates — Garage facilities — Special floor reserved for ladies.
A great hotel in a great city!

2500 ROOMS — $2.50 UP

LEONARD HICKS, *Managing Director*

MORRISON HOTEL
Madison and Clark Streets, CHICAGO

30-DAY FREE TRIAL

CHICAGO GOVERNOR & MFG. CO.
505 S. Laflin St., CHICAGO, U. S. A.

Gentlemen:

Send us the CHICAGO GOVERNOR for 30-day free test under our everyday working conditions. It is understood that this obligates us in no way.

Make and Model Car .....

Firm Name .....

Address .....

City ..... *Signed* .....

PIN THIS COUPON TO YOUR LETTERHEAD

as WE GO to PRESS

(News from the Manufacturers)

ALL the articles excepting "commercial commodities and raw materials" listed in the parts catalog of a large truck manufacturer have been ruled taxable by the Bureau of Internal Revenue. The term "commercial commodities" includes such articles as ball and roller bearings, common bolts, nuts, washers, screws, nails, tacks, rivets, pins, studs, cotters, pipe fittings, grease cups, oilers, etc. The term "raw material" includes such articles as are sold by the foot or yard, such as cloth, leather, matting, binding, cables, tubing, etc.

•

STAINLESS steel body panels feature the construction of an attractive truck body recently built for Benjamin Moore & Company, nationally known paint manufacturer. Although stainless steel has been put to diversified uses since its development, its use for truck bodies marks the newest innovation in the truck body industry.

•

EFFECTIVE March 10th, the name of the American Brake Materials Corporation, manufacturers of "American Brakeblok" has been changed to The American Brakeblok Corporation. The change in name was made in the interests of clarity and effectiveness, but it does not indicate any change in policy. The address of The American Brakeblok Corporation remains 4660 Merritt Avenue, Detroit, Mich., as in the past.

•

RECEIVERSHIP action on The Studebaker Corporation will in no way affect The White Motor Company, or interfere in any way with the manufacture and sale of all White products, according to a statement issued by A. G. Bean, President of The White Motor Company. "Receivership will in no way interfere with our continued operations and we will manufacture, as in the past, White and Indiana trucks, and handle the sale of Studebaker, Pierce-Arrow and Rockne trucks and buses," Mr. Bean said.

•

A NEW product called "Pento" has been developed, that is claimed to be a non-poisonous, anti-carbon fuel energizer. "It is an organic, liquid compound which, when added to plain gasoline in minute quantities, has the effect of causing more oxygen to be absorbed by the fuel as it passes through the carburetor, thus promoting full combustion and increasing the efficiency of the engine," the makers state. Fleet owners in the East are testing this out at present and full information will be supplied by Pento Products Corp., 254 Front St., New York City, without obligation.

•

IN a movement to help state trucking organizations bring the true story of highway transportation to the public as quickly as possible, and to combat the tremendous volume of propaganda being released throughout the country by other transportation interests, Harvey C. Fruehauf, president of Fruehauf Trailer Company, Detroit, has organized an information service for state trucking associations. Authoritative articles will be sent regularly to all associations, who, in turn, will be urged to seek their publication by newspaper editors.

•

AN advertisement of The Pittsburgh Parts Corporation appears elsewhere in this issue. By way of introduction (in case you are not familiar with the facts) this Corporation has been in business for seven years and reports a substantial increase in business during 1932, over that of 1931. It specializes in the manufacture of replacement parts to fit White trucks and buses, and reports that it is now servicing "large fleet operators in every continent of the globe, including the U. S. Government, a great many municipalities, State Highway Departments, bus companies, vocational fleets, etc."

•

THE new White City Coach, which features a 12-cylinder "pancake" horizontally opposed engine mounted beneath the flooring, is now being demonstrated on a 10,000-mile swing through Eastern states. The coach is accompanied by J. A. Kiggen, Jr., Manager of the Motor Coach Department of The White Company and representatives of the engineering department, who explain the working of this new engine, and the various features of the coach.

•

A BOOKLET entitled "Reasons for the Legal Recognition of the Six-Wheel Truck and for Uniform Motor Vehicle Legislation" has been prepared by F. M. Higgins, of the Research Department of The Four-Wheel-Drive Auto Company, Clintonville, Wis. The booklet contains a wealth of information and is well illustrated and set forth in a non-technical manner. If you haven't received your free copy, write to the Company, or to the Editor. No obligation, of course.

•

TWO new models serve to round out the line of General Motors Truck Company, Pontiac, Mich. They are the T-33 and the T-43 and are 3 and 4-tonners, respectively, featuring the new "257" overhead valve engine recently developed by the Company. In design and basic engineering, the two models are identical, differing only in dimensions and mechanical specifications. Illustrated literature sent free on request to the Company or to the Editor of this publication.

•

A NEW semi-trailer, a new finance plan for dealers and fleet owners, and a new selling plan have been announced recently by Whitehead & Kales, trailer manufacturers, River Rouge, Michigan. The new job is known as the "Traveler" and marks the entry of this company into the lowest-price field. Further information, prices, etc., will be sent on request, without obligation.

•

ANTICIPATING the need for a low-priced, high-quality 2-ton truck, International Harvester offers a new 6-cylinder job known as Model B-4. This chasis is available in three wheelbases and is adapted to the mounting of bodies to meet every transportation requirement in which trucks of this capacity are practical, the makers remark. Wheelbases available are 145 inches for dump and semi-trailer service; and 170 and 185 inches for general hauling. The engine is of International design and manufacture. An interesting folder describing the new model is available and will be sent free. Address: International Harvester Company, Chicago, Ill.

•

A DIESEL-POWERED truck, with a Cummins Diesel engine in an Indiana heavy-duty chassis, will be merchandised through the nation-wide facilities of The White Company, according to a recent announcement. These trucks will be built only on order and the guarantee on the engine will be assumed by the Cummins Engine Company, of Columbus, Ind. The general design of the engine is comparable to a gasoline engine, except that there are no spark plugs, no electrical distributor and no carburetor. S. A. E. mountings and standards are adhered to. Write The White Company, Cleveland, Ohio, for details, mentioning FLEET OWNER, please. The Cummins Engine Company, Columbus, Ind., will also send details of the engine.

A complete line of superior quality axle shafts for all makes and models of passenger cars, trucks and buses. A special engineering service to study your individual problems is available to all responsible fleet operators.

Write for complete information

The U. S. Axle Co. Inc., Pottstown, Pa. U.S.A.

Kwick-Kut cuts patterns (Not just grooves) on worn-smooth tires. Has convenient top guide handle—six removable blades. Truck sizes—$12.50 to $30. Others $4.50 to $10.

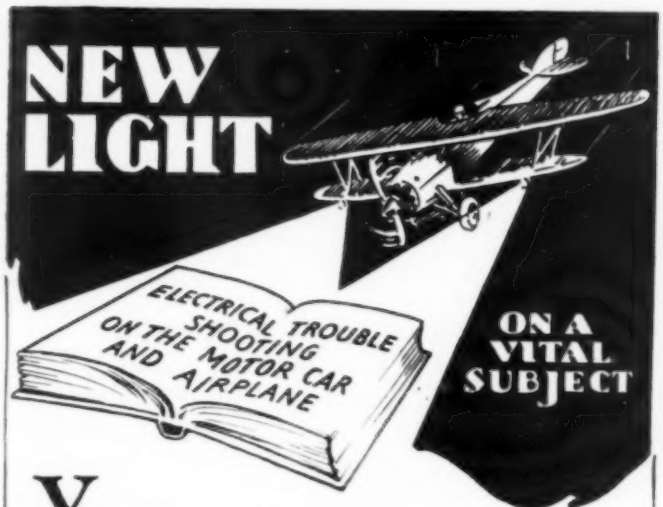
PROTECT

YOUR FLEET BY KWICK-KUTTING SAFE TREADS ON "BALD-HEAD" TIRES

Add hundreds of extra safe miles to the life of your tires. Reduce tire costs . . . . And maybe accident costs. Genuine Kwick-Kut Electric Hot Knife Groovers are now being used by Fleet Owners throughout the country. Let us prove to you what a remarkable tool we have. *Write for FREE TRIAL OFFER.*

KWICK-KUT MANUFACTURING CO., INC.
3821 Arsenal St. St. Louis, Mo.

NEW LIGHT



ON A VITAL SUBJECT

You *will surely want a copy of*

"ELECTRICAL TROUBLE SHOOTING"
(on the Motor Car and Airplane)
By A. H. PACKER

A new edition is just off the press. It covers everything from wiring to armature rewinding. Takes up generators, starters, cutouts and regulators on all cars, trucks, busses and airplanes. Contains scores of test kinks that will be found handy in the shop. Explains test bench construction; takes up flat rates; in fact anything electrical in the automotive game.

Earns its cost on first job's profits. Has 47 chapters, 330 pages, 353 illustrations, over 600 questions and answers, four trouble shooting charts and a thorough index. Size 5½ x 8 inches. Flexible binding. Price $4.00. Sold on five-day trial. Money back if not satisfied.

Book Department
The FERGUSON PUBLISHING CO.,
90 West Street New York City

Mr. President:

DOES your Financial Statement show a Deficit? Are your Truck Deliveries causing part of this Deficit?

If so, you need a Man who can cut your Trucking Costs to a Minimum! The day is past when a Mechanic can supervise a Fleet costing thousands of dollars.

Each Fleet needs an Executive who can analyze the complicated problems of Cost Accounting, Taxation, Personnel and Sales Cooperation. He must be familiar with the latest practice in Maintenance and Operation and the modern high components of today's Transportation requirements.

Such a man is now available and would like to have the opportunity of discussing this problem with you. Strict confidence will be appreciated and respected. Address Box 815, c/o Editor, FLEET OWNER, 90 West Street, New York, N. Y.

Wisco Fittings

All Standard Sizes and Shapes

WISCO GREASE FITTINGS are made from *steel* with pins *machined* on bodies, with triple-length (non-crystallizing) springs. They are interchangeable with other standard fittings, can be securely *tightened* in place without fear of stripping threads. They give long efficient service.

WISCO FITTINGS can cut your costs in half. Write for Free Sample today.

WISCO PRODUCTS, INC., Racine, Wis.

Many Prominent Fleets Add Safe Tire Mileage With This Remarkable Tool

Among the many large fleets using the ROLL-ABOUT GROOVER with excellent results are:

John Wanamaker Stores
Gimbel Brothers Store
Reading Transportation Co.
Penna. Power & Light Co.
Philadelphia Gas Works
Phila. Public Ledger
Phila. Inquirer
Koppers Coke Co.
Metropolitan Edison Co., Reading
Freihofer Baking Co.
Metropolitan News Co., N.Y.C.
Consumers Gas Co., Reading

Add thousands of safe miles to life of YOUR "baldheaded" tires with the ROLL-ABOUT GROOVER. Mail coupon today.

This Coupon will save you Money!

SAFE TOOL MFG. CO., 4-33
Bridgeport, Pa.

Send me complete information and price of the "ROLL-ABOUT GROOVER".

Name: .....

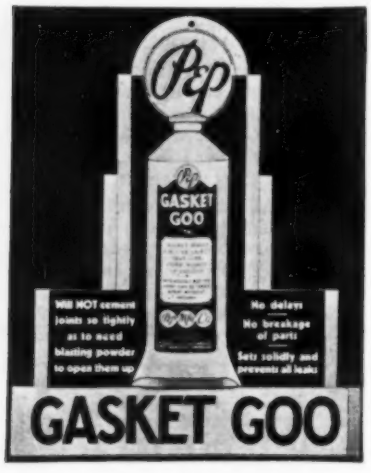
Address: .....

City: ..... *State:* .....

for ROAD *and* SHOP

Free Sample of "Gasket Goo"

WHILE the display card, recently developed by Pep Mfg. Company, is not of interest to fleet shops from a sales standpoint, the product itself, is of concern we believe.



Gasket Goo is claimed to be a perfect gasket compound that sets solidly, makes a practical gasket and prevents all leaks. However, it will not cement joints so tightly that "blasting powder" will be needed to open them up when necessary later on, the makers point out.

All readers are invited to use this compound at the manufacturer's expense. A letter to Pep Mfg. Co., 33 W. 42nd St., New York City, or the Editor of this publication, will bring, *absolutely free*, a BIG SAMPLE of Gasket Goo.

●

Dual Pressure Equalizers

A PRESSURE equalizer for maintaining uniform pressure in dual pneumatic tires is being manufactured by A. Schraeders Son, Inc., Brooklyn, N. Y., makers of tire valves and equipment.

A flexible connection is provided containing an automatic check valve which shuts off the free interflow of air from one tire to the other when the air pressure reaches a predetermined minimum. This is usually about five pounds below normal recommended operating pressure.

Connecting the two tires by means of an ordinary flexible tubing would keep the same inflation in both tires, but in case of a severe cut or blowout, which would cause one tire to go flat, the other tire would also lose its air. Few operators would be willing to take chances on having to change two tires in case one went flat.

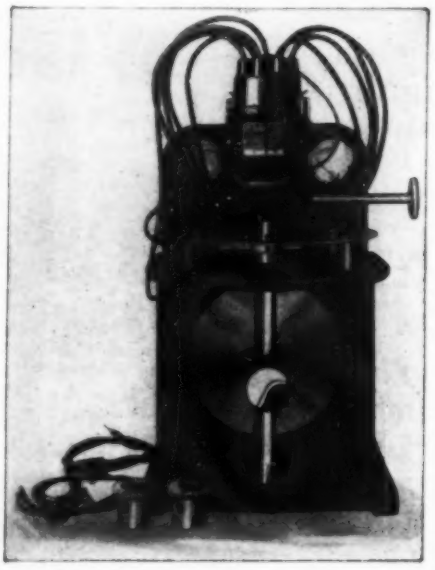
The dual pressure equalizer keeps the pressure equal in both tires, and in event of one tire losing pressure below a certain point, shuts off the flow of air from the other one.

●

Mallory Ignition Tester

THE electrical testing unit, illustrated here, is one of the latest products of Mallory Electric Corporation, Detroit, Mich. It is known as the Mallory Ignition Tester.

This machine is equipped with a suitable means for revolving the distributor at any desired speed, a stationary spark gap, a large rotary gap, eight special spark plugs, an ammeter, milliammeter and all wires and leads. It has positive speed control and can actually be set to turn the distributor as low as 100 r. p. m. The speed range is 100 to 3,000 r. p. m., equivalent to twice as much in engine speed.



The Mallory tester will synchronize contact points, check such units as governor, distributor, coil, condenser and all adjacent electrical units. Illustrated circular on request.

●

Heater Makes Starting Easy

A NEW device known as the G. E. automobile water heater will maintain an automobile in suitable condition for easy starting during the winter, according to G. G. Sommerville of the General Electric laboratory at its Pittsfield plant. The device is electrical and must be used in a wired garage.

The automobile water heater consists of a small, 110-volt, 100-watt, cartridge-type, immersion heating unit permanently located inside the circulating-water hose connection. By connecting it after turning off the engine, the engine temperature is maintained without overheating until the car is next used. The heater operates satisfactorily in the various anti-freeze solutions used in automobile cooling systems and can also be safely left in the water circuit during the summer.

Tests have shown that with the automobile water heater used overnight, the car can be started without the excessive choking, oil dilution, and battery wear ordinarily experienced on cold mornings.

●

Shop Equipment Booklet Offered

A BOOKLET showing and describing the automotive servicing work that can be done practically in shops of various sizes has just been issued under the title "Lathes for the Service Shop."

More than eighty photographs of shops and set-ups of different jobs requiring machining or grinding make the booklet both interesting and instructive. The jobs shown include a wide variety of servicing, including valve grinding, brake drum and wheel work, armature truing, differential ring-gear replacing, piston fitting, crankshaft truing, connecting rod servicing, flywheel machining, bushing making and screw thread cutting. Equipment for handling this work is illustrated and described.

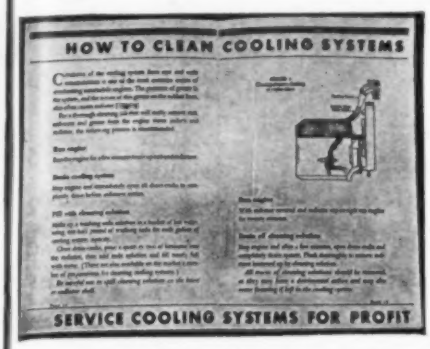
Other data in the booklet shows how to do reaming, drilling, boring, filing, taper turning, keyway cutting, reamer sharpening, grinding and cutting-off work.

Those readers who desire a copy of this booklet may obtain one gratis by writing to the Technical Service Dept., South Bend Lathe Works, South Bend, Indiana, and mentioning the name of this publication. Just ask for Bulletin No. 36.

NEW STUFF *for* ROAD *and* SHOP (*Continued*)

Free Cooling System Manual

THIS interesting and valuable booklet is free for the asking. It treats with proper cooling system maintenance —a problem that must be faced by all operators and owners of automotive-vehicles.



Each year, National Carbon Company revises this cooling system service manual so that it contains the most up-to-date methods of maintaining proper cooling system efficiency.

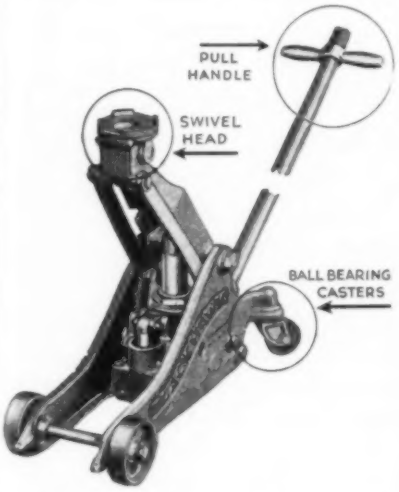
The directions and recommendations cover the complete servicing of all parts of the cooling system, including water pumps, radiators, hoses and gaskets and give simple instructions for both preventive and corrective cooling system service.

Any reader interested in receiving a copy of this manual may obtain one without cost by writing to the National Carbon Co., Inc., Room 1328, 30 East 42nd Street, New York City. The Editor of FLEET OWNER will get a copy for you, if you prefer.

●

Blackhawk Short Floor Jack

A NEW hydraulic floor jack is announced by Blackhawk Manufacturing Co., Dept. F. O.-3, Milwaukee, Wis. It is equipped with a swivel head and ball-bearing casters, for parking and turning cars, having a



capacity of 3,000 lbs., making it ideal for passenger cars and light commercial vehicles.

The lifting range is from 4¼ inches (low) to 20¼ inches (high). The Blackhawk "lightning lift" feature is incorporated in this jack, utilizing double automatic pumps. It is particularly suitable to handle the new super-balloon tires, the makers point out. They will be glad to send catalog sheet and net price on request.

●

New Bendix Magneto Announced

THE Bendix Magneto is a new product of the Scintilla Magneto Co., Inc., Sidney, N. Y. Bendix Magnetos and Bendix Impulse Couplings are now in production in the Scintilla factory. Numbers of these have been sold to engine manufacturers but they have not previously been announced.

These magnetos are constructed on the rotating magnet principle—coil, breaker and condenser being stationary. The use of slip rings or collector rings is eliminated. The magneto is completely enclosed and fully protected against dust, dirt, oil and water. Adequate air circulation is provided, however, through the magneto.

The contact breaker is a new, pivotless design, no breaker lever pivots being used. A large felt wick oiler lubricates the breaker cam. The distributor shaft as well as the drive shaft is mounted on ball bearings, packed in grease. These features enable the magneto to operate for long periods without attention.

●

Water Pump Parts in New Catalog

THE Toledo Steel Products Company, Toledo, Ohio, manufacturers of Toledo Super-Forged Valves, Toledo Bolts and Bushings, and Toledo Water Pump Parts, has just issued a new forty-page water Pump Parts Catalog.

This Catalog contains complete listings and information on Toledo Water Pump Parts, covering passenger cars, trucks, busses, taxicabs, tractors and motors. It is considered by the trade to be the most complete Water Pump Parts Catalog published. A copy may be secured by writing The Toledo Steel Products Company, Toledo, Ohio. The Editor will get one for you, if you prefer, without obligation.

●

"Floating Power" for Fords

IT is announced that through a license arrangement with the Amplex Division of the Chrysler Corporation, Skinner Motors, Inc., of Detroit, Mich., are now manufacturing patented "floating power" engine mountings, available as replacement parts for Ford Model "B" cars.

The mountings are said to remove considerable objectionable vibration. The front mounting is located beneath the water pump. The rear mounting is located beneath the transmission. An imaginary line extending between these two mountings passes through the center of gravity of the engine. Thus the engine is supported in perfect balance.

The installation takes less than two hours and costs but a few dollars, according to Skinner Motors, Inc., 2229 Dalzelle, Detroit, Mich., who will be glad to send further details on request. Please mention this publication when writing.

●

Thermoid's All-Purpose Lining

THE new Thermoid F-M-L is a single type of lining for use on all brakes. "Road conditioned in the factory which means controlled friction on the car," is the explanation of Thermoid engineers.

This new lining is claimed to "come in" at the start with a pleasing, soft pedal action and maintain this uniform performance regardless of climatic or road conditions. It is also said to be quiet, non-grabbing and non-scoring.

Two new features in the physical appearance of brake lining are apparent in this Thermoid product. 1. Ground on the shoe side to insure perfect fit, prevent slippage and friction between lining and shoe. The size of the lining is now plainly branded on the lining itself. 2. Machined on the surface with a light herringbone effect to insure "coming in" immediately after installation. The lining is so constructed that it provides a flat, level surface when bent to the contour of the shoe. This gives whole-surface contact immediately after installation and eliminates the necessity for any grinding, burning-in or burnishing, the makers state.

Thermoid engineers have tested the new F-M-L Brake Lining over a long period and are highly satisfied with the results. Further information may be obtained from Thermoid Rubber Company, Trenton, N. J.

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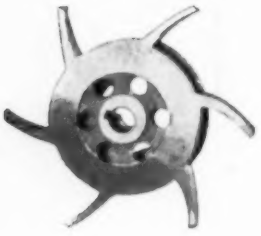

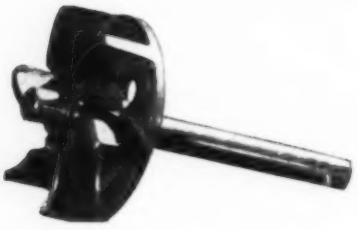

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